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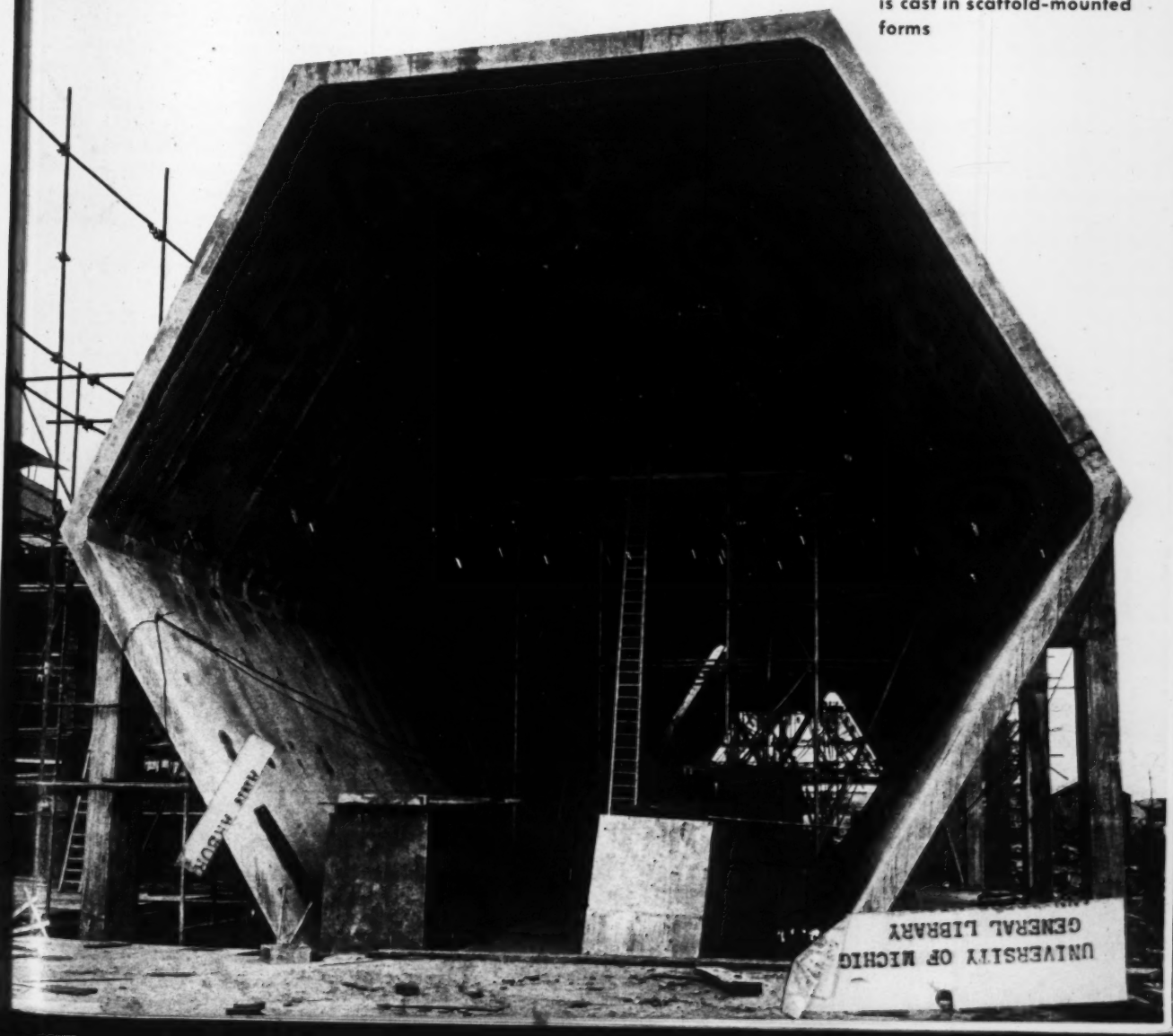
NEWS—ISSUE APRIL 22, 1948



CONCRETE WIND TUNNEL for testing British aircraft is cast in scaffold-mounted forms

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LOWER COST

Look how one wise contractor utilizes electric drives to produce aggregate for large construction jobs. In this modern plant there is a total of 765 electric-motor horsepower driving jaw crusher, rotary scalping screen, log washer, rotary crusher, sand roll, sand classifier, sizing screen, elevator and conveyors. That's real versatility . . . and it's indicative of the trend toward more and varied use of electric power in construction.

Electric drive, which offers the maximum in reliability with minimum maintenance, helps contractors build more for less . . . faster. Whether you buy or build contractors' equipment, ask your General Electric representative to show you the inherent advantages of electric drive. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

News of the Week

ENGINEERING NEWS-RECORD • APRIL 22, 1948 • VOLUME 140 • NUMBER 17

Atom-plant waste disposal poses hazardous problems

Safety conference told there is no answer yet as to means for neutralizing radioactive wastes—Ocean burial in concrete blocks is best suggestion.

Probably the best suggestion thus far for the disposal of the highly toxic and potent radioactive wastes from atomic-energy plants is to concentrate the waste solution and use it as a liquid for making concrete blocks that would then be dumped in the deepest areas of the ocean.

Public health hazards

This was revealed last week at a conference of the Greater New York Safety Council by Forrest Western of the Oak Ridge National laboratory, operated under the direction of the U. S. Atomic Energy Commission. Dr. Western, who discussed the public-health hazards resulting from radioactive wastes, outlined the possible means for minimizing the harmful effects of radio-isotopes on animal and plant life.

Peacetime problems in radioactive waste disposal arise from (1) operation of a chain-reacting pile for production of plutonium; (2) production of radio isotopes; (3) production of atomic energy; and (4) from distribution of radio isotopes for experimental purposes. Presence of these waste products may constitute a serious health hazard, not only because of their extreme toxicity but also because of a potency that may exist for thousands of years (one such isotope was cited as having a half-life of 24,000 years).

Neutralizing impracticable

Persons approaching the problem of radioactive waste disposal for the first time sometimes ask, said Dr. Western, "How can these radioactive materials be neutralized?"

"The reply to this question is two-fold: (1) For our purposes, there is no practical method of changing the radioactive properties of a large fraction of any of the radio-isotopes in this connection; and (2) medical research has not discovered any treatment which is known to neutralize the tissue damage produced by such isotopes after they are fixed in body tissue."

In outlining means by which harmful concentrations may be controlled, these possibilities were cited to members of the group:

Dilution—If the wastes are diluted by disposal into streams or other bodies of water, there is no assurance that they will remain dilute. Nature frequently shows remarkable ability to concentrate various chemical elements. For example, a small bit of algae may concentrate radioactive wastes to the extent that the radiation from the algae may be detected at a distance of many feet. Clays and other minerals also strongly absorb radio-isotopes. Many well-informed persons therefore question whether radioactive wastes can be made safe by dilution.

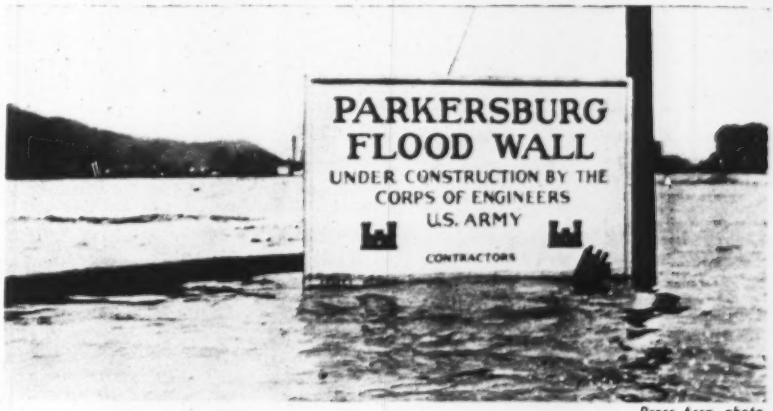
Mixing Isotopes—A second type of dilution may perhaps be used with safety. This involves dilution of radio-isotopes with one or more stable isotopes of the same chemical to the point where plant or animal life cannot take them up.

Storage—If some place can be found to store the waste for a considerable time, a large portion of the radioactive material can "decay" into stable isotopes without any chance of producing damage. Applications of this principle are limited by the half-life of the material and availability of suitable storage space. For example, when one considers an element with a half-life of 24,000 years, what sort of container may be expected to endure for that length of time?

Concentration—Removal from process fluids by concentration would reduce volume and thus lessen in part the requirements for storage space. Methods of concentration under discussion involve principles of ion exchange, absorption, precipitation, sedimentation, solvent extraction and evaporation processes.

Ultimate Disposal—Once the wastes are concentrated, then what? There is some talk of placing them in storage until national or international policies

(*Continued on page two*)



Press Assn. photo

***Too Late**—A sign announcing start of work on a $4,000,000 floodwall at Parkersburg, West Virginia, stands forlornly above swirling waters of the Ohio River, in one of a series of floods along the Ohio that covered farmlands and flooded riverside cities and towns last week. At Parkersburg, where the Little Kanawha River joins the Ohio, the river topped 42.8 ft.—6.8 ft. above flood stage.*

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Public Construction—Cost of three new buildings at the state hospital, *Binghamton, N.Y.*, is now estimated at $4,942,352 . . . *Great Falls, Mont.*, has approved a $1,770,000 bond issue for two schools . . . Southeastern Louisiana College at *Amite, La.*, will spend $5,000,000 for new buildings . . . The dock board at *New Orleans, La.*, will spend $1,750,000 soon for new facilities along the river front . . . State construction and operation of the Foster Creek Dam in the Columbia River in eastern *Washington* has been proposed by Gov. Mon C. Wallgren. Corps of Engineers studies indicates the cost of the dam would be over $170,000,000 . . .. The school committee of *Boston, Mass.*, has voted $200,000 for plans for a proposed $5,000,000 educational center.

Industrial Construction—Ground has been broken for a new $5,000,000 telephone building at *White Plains, N.Y.* . . . A new headquarters building for the Western Electric Co. will be built on a site equal to four blocks in downtown *New York City* . . . A $1,500,000 paper box plant will be built by the St. Joe Paper Co. at *Houston, Tex.* . . . John Taylor and Co., *Kansas City, Mo.*, will build a new store to cost $7,000,000 . . . The Union Pacific R.R. has let contracts for construction projects in seven states to cost $6,680,500—the biggest is a 59-mile installation of centralized traffic control, between *Los Angeles* and *Riverside Calif.* . . . Construction of a $20,000,000 power station on the Ohio River near *Lawrenceburg, Ind.*, has been announced by the Indiana and Michigan Electric Co. . . . Construction of the proposed $20,000,000 Statler Hotel in downtown *Los Angeles, Calif.*, will be delayed until adequate street development is provided. Arthur Douglas, president of the Hotels Statler Corp., has informed Mayor Fletcher Bowron. . . . Expenditure of $1,500,000 for plant additions during 1948 is planned by the United Natural Gas Co. of *Oil City, Pa.* . . . Construction has started on a $1,250,000 margarine plant for the Delpro Refining Co. at *Wilson, Miss.*

Housing—A 12-story, $2,000,000 garden apartment will be erected at 418-440 E. 79th St., *Manhattan, New York City* by Tishman Construction Corp. . . . Arrowbrook Park Homes—412 two-story houses—are beginning to rise at Main Street near Jewel Avenue, *Kew Garden Hills, N.Y.C.* . . . Under a new veterans low rent housing act *Massachusetts* pledges its credit up to $200,000,000 and agrees to make contributions up to $5,000,000 annually for 25 years . . . City planning board, *Utica, N.Y.*, proposes two groups of garden type rental apartments to cost about $1,500,000 . . . Joseph C. Troidle, Buffalo, N.Y., builder, announced plans for an apartment development in suburban *Amherst* to cost $1,060,000. . . . Construction has started on the Town and Country apartments, biggest housing project ever approved by the FHA for *Houston, Tex.*, on a 38-acre tract just south of Brays Bayou. The project will provide 488 living units and cost more than $5,000,000, according to H. M. Cohen and M. A. Silverman, sponsors.

Highways—Highway Department figures show that 3,859,157 persons visited *Texas* by automobile in 1947 and they spent $178,562,365 there . . . *Los Angeles, Calif.*, must work out a plan whereby 30,000 families to be displaced by the Hollywood and Harbor freeway projects will be provided new quarters.

Drouth Relief—The Bureau of Reclamation has authorized construction of the $28,000,000, 210-ft. high Cachuma Reservoir on the Santa Ynez River in Santa Barbara County, Calif. (ENR April 8, vol. p. 581). A 210,000 ac. ft. reservoir will regulate runoff from winter rains, and the project will include a six mile transmountain diversion tunnel.

Miscellany—A master plan to ease traffic in *Jamestown, N.Y.*, will be prepared by the New York State Department of Public Works after a survey of source and destination of traffic . . . The U. S. Government recently agreed in Federal Court to pay *Boston, Mass.*, $154,831 damages as a result of a Liberty freight ship crashing into the Charlestown Bridge on Dec. 17, 1945.

Radio-active waste disposal discussed

(Continued from page one)

are established. Perhaps the best method so far devised for diposal is that of using the concentrated solution as the liquid for making solid concrete blocks that could be dumped into the ocean. This will give assurance that the major portion of the radioactive material will stay in one place for a long time during which "decay" will take place. However, for such long-lived elements as plutonium, some persons feel that this method leaves something to be desired.

Another important feature of any waste disposal program, continued Dr. Western, is the monitoring of discharged air and water to assure that their radioactive contents do not become excessive.

The problem relating to the disposal of small amounts of radio-isotopes used in experimental work calls for the minimum precaution—should they be let out of the custody of a responsible person—of diluting them below harmful concentrations.

Atomic warfare hazards

It is not comforting to realize that one of the most hazardous of radioactive materials is the unfissioned plutonium which is released in the use of a plutonium bomb. As a result the population of large areas may find the air they breathe, the food they eat, the water they drink, and perhaps anything that they can touch, contaminated with harmful quantities of radioactivity.

Upon the problem of control of radioactive materials in time of war, Dr. Western declared, he was not in a position to speculate.

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Cheaper sewage treatment is promise of tests using oxygen for aeration

Research at Harvard Graduate School of Engineering shows that oxygen substituted for air in biological-sludge processes could cut plant size by three-quarters

Great savings in sewage purification costs are foreshadowed by an improved biological treatment process in which pure oxygen is substituted for the air normally used for aeration.

Reduction in size of plant to one-quarter of conventional installations is indicated on the basis of research results obtained by Daniel A. Okun, teaching fellow in sanitary engineering at the Harvard Graduate School of Engineering.

Development of the process—which has been termed "bio-precipitation"—was inspired by Malcolm Pirnie, consulting engineer of New York City. Mr. Pirnie suggested that because oxygen was now commercially available at very low prices, its applicability to a biological process might be studied. It was pointed out, among other things, that whereas sewage saturated with air contains only about 9 ppm. of dissolved oxygen, sewage saturated with oxygen will contain 45 ppm.

In conformity with a flow pattern suggested by Mr. Pirnie, laboratory apparatus was devised by Mr. Okun to oxygenate settled sewage. This was done in a vertical glass tube so arranged that settled sewage could be fed continuously from the top, with the oxygen diffused from the bottom and moving countercurrent to the sewage flow. Oxygenated sewage was then pumped into the bottom of a precipitation tube containing the suspended biological floc. Effluent was collected from the top of the tube, part of which was recirculated with the incoming sewage.

Advantages of process

According to Mr. Okun, the bio-precipitation process overcomes some of the disadvantages of a conventional activated-sludge process by embodying three new ideas:

1. Oxygen requirements are satisfied at all points in the flow by pre-oxygenating the sewage to be treated.

2. Use of pure oxygen promotes efficient gas transfer, and the high oxygen gradient enables the oxygen to penetrate deeper into the floc particles.

3. Separate final sedimentation facilities are not required. The biological media are not permitted to suffer the hazard of anaerobiasis (insufficiency of oxygen) ordinarily associated with sedimentation in final tanks.

Because of the more "sympathetic" treatment of the biological floc, and because more of it can be maintained in a given space than in an activated-sludge process, reports Mr. Okun, it is reasonable to expect better purification per unit of tank volume with the bio-precipitation process.

He states that the bio-precipitation process can be loaded about four times more heavily than a conventional activated-sludge process to achieve substantially the same results. In other words, for the same quantity of sewage treated, about one-quarter of the plant is required. The cost of oxygen at $4 per ton was found to be about equal to the cost of compressing air at about 1 cent per kwh.

Pilot plant proposed

"All evidence", says Mr. Okun, "points to the possibility of great savings in sewage-purification costs by the use of the bio-precipitation process. However, more precise assessment of its advantages must await the operational results of a proposed pilot plant, negotiations for the construction of which are already under way."

The research was conducted under the direction of Gordon M. Fair, dean of the Harvard Graduate School of Engineering.

Young to leave reclamation bureau

Walker R. Young, for the last three years chief engineer of the Bureau of Reclamation, will retire June 30, a bureau announcement said last week.

Mr. Young will be succeeded by L. N. McClellan, now assistant chief engineer.

The retirement will end a 37-career on the bureau's engineering staff for Mr. Young. A native of Butler, Ind., he was an engineering graduate of the University of Idaho (1885), and he spent three years after graduation as a mining and civil engineer in the office of the Idaho State Engineer, at Boise. He began his long career with the bureau with an engineering assignment at Arrowrock Dam in Idaho, and ten years later was assigned to make site studies and prepare preliminary designs and estimates for the construction of Hoover Dam and power plant. He later served as construction engineer on that project.

Other bureau assignments, prior to his appointment as chief engineer in January 1945, included: construction engineer on the Kittitas Division of the Yakima Project, Washington, and supervising engineer on the Central Valley Project in California.

Mr. McClellan is a native of Middletown, Ohio, and was an electrical engineering graduate of the University of Southern California in 1911. He joined the bureau in 1911 to work on its Salt River Project in Arizona, and has served continuously since that time, excepting for U. S. Army service in World War I.

Top-level changes—Walker R. Young (left) for more than three years chief engineer of the Bureau of Reclamation, will retire June 30. He will be succeeded by L. N. McClellan (right), now assistant chief engineer.

DEVELOPMENTS BEYOND U. S. BORDERS

Digested from reports by Engineering News-Record correspondents and the McGraw-Hill World News Bureau

First Inter-American sanitary engineering conference meets in Chile—Australia plans three new bridges—Other foreign news

Chile—More than 200 representatives from 20 American nations met in Santiago April 8 for the first annual Inter-American Congress of Sanitary Engineering.

The importance of the occasion was dramatized in a personal welcome from President Gabriel Gonzalez Videla of Chile. His minister of public work, Ernesto Merino Segura, also lauded the efforts of sanitary engineers in the promotion of public health and higher living standards.

Replying for the United States delegation, Clarence I. Sterling, director and chief engineer of the health and sanitation division, U. S. Institute of Inter-American Affairs, described how the new organization came into being as a result of cooperative sanitation projects executed during the war.

The congress in Santiago is an outgrowth of regional conferences held in Rio de Janerio (*ENR* July 4, 1946, vol. p. 4) and Caracas, Venezuela (*ENR* Oct. 10, 1946, vol. p. 471), which led to the establishment of an Inter-American Association of Sanitary Engineering. The association now has a membership of about 1,000; 200 in the U. S.

The president of the Chilean section of the association, Ruperto Casanueva del Canto, was named chairman of the congress by acclamation. The meetings continued for eight days during which delegates discussed the management, design and operation of sanitary works.

Among those from the United States participating in the program are: Robert Hardman, engineer of The National Water Main Cleaning Co., N. Y.; Wellington Gilcreas, director of laboratories, New York State Department of Health; Victor M. Ehlers, chief engineer, Texas State Department of Health and E. S. Tisdale, senior sanitary engineer, U. S. Public Health Service, Washington.

Exhibitors of equipment at the meeting include: Wallace and Tiernan Co., Inc., Neptune Meter Co., The Dorr Co., Permutit Co., Simplex Valve and Meter Co. and the Refinite Co.

Industrial Developments . . .

England—A new London firm, Aluminum Housing Corp., is now shipping prefabricated aluminum houses to the British West Indies and Portuguese East Africa and is conducting negotiations in France, South Africa, Australia, New Zealand, Argentina, Brazil and the United States for the further export of these units. The firm is associated with several British housing and aircraft companies that have already built and erected some 60,000 aluminum prefabs in the British Isles.

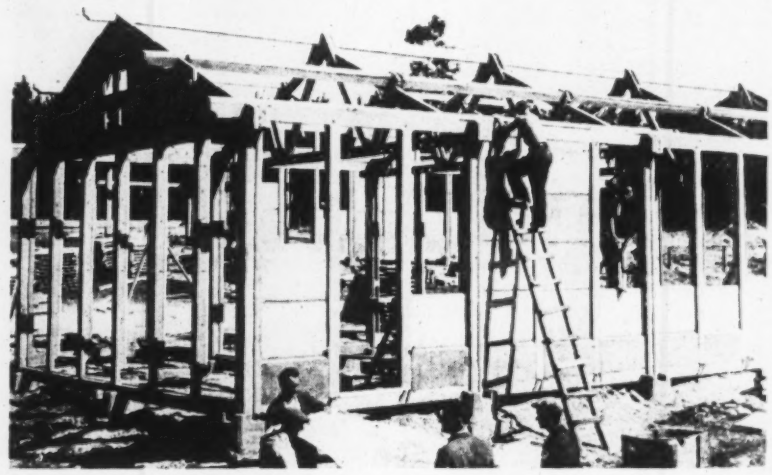
Venezuela—The Ministry of Development has announced that Venezuelan and Argentine interests will jointly build a 20,000-barrel, $5,000,000 refinery at Puerto La Cruz, Venezuela. It is expected that competitive bids will be invited from U. S. constructors, and that the refinery will be in operation within two years.

The refinery will be supplied from oil paid to the Venezuelan government as royalty, and which is now being resold to the producing companies. Although the present refinery capacity of the country is 134,000 barrels daily and new refineries now under construction will more than double that figure, less than one-third of the oil produced in Venezuela will be refined there. Ministry officials said private American interests have offered to build refineries in Venezuela, but that the government has reached no decision about them even though it is desired to have as much Venezuelan oil as possible refined within the country.

Puerto Rico—The Puerto Rico Clay Products Corporation, formed to meet the anticipated heavy demand for building materials in the island, opened its first factory last week at San Juan. Built at a cost of $635,000, the plant will employ native Puerto Ricans and will produce structural tile and clay pipe.

Netherlands—One of the largest office buildings in the Netherlands is now under construction near The Hague to serve as headquarters for K.L.M. Royal Dutch Airlines. A concrete and steel structure, the building will house the entire 1,800-person office staff of the air line.

Mexico—Petroleos Mexicanos (Pemex), the official Mexican oil company, last week denied reports that it would build a $12,175,000 pipeline between the Faja de Oro oil fields in Vera Cruz State, to Torreon, Coahuila State. Sen.



***Concrete Prefabs**—Prefabricated concrete houses that include concrete beams, end panels and sidewalls, are being erected on an experimental basis in a 1,220-unit project in coal mining areas of French Lorraine. Joists, rafters, roof-poles, tie-beams and all other components are precast at the site to standard specifications and lifted into place by an overhead crane. Walls are standardized concrete slabs, fitted between the joists in slots*

Antonio J. Bermudez, Pemex director general, explained that while Pemex is considering the project, it is unable to execute plans for it at present because of other current building commitments.

Egypt—The U. S. Export-Import Bank has announced a credit of $5,600,000 in favor of the Egyptian Fertilizer and Chemical Industries, Ltd., of Cairo, to purchase equipment and to pay for engineering for a plant near Suez. Chemical Construction Corp., New York City, has been engaged for the design and supervision of the proposed $19,000,000 project.

Australia—From the famous Great Barrier Reef which fences in wide stretches of the northeast coast of Australia the Queensland Cement & Lime Co. is now taking out enough calcareous matter to produce 15,000 bags of cement daily. The company's coral fleet consists of a ladder dredge and a suction dredge, and carriers land the coral cargo at the firm's wharf near the mouth of the Brisbane River. Three other raw materials used in the production of coral cement are supplied from nearby sources—highly aluminous shales, highly silicious clays and ironstone.

Venezuela—Under a $15,000,000 contract recently signed by the Venezuela government, the Swedish firm of L. M. Ericsson will completely reorganize and modernize the country's telephone, telegraph and radio systems.

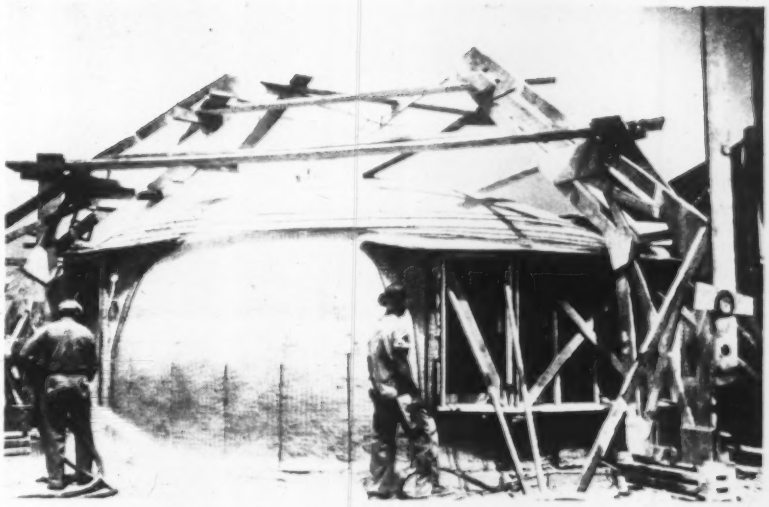
Power . . . .

India—The Indian government has consolidated all work on design of water power and irrigation dams into a Central Designs Organization under the Central Water-Power, Irrigation and Navigation Commission. The CWINC, which formerly handled much of the preliminary planning for such work as the Kosi, Damodar Valley, and Mahanadi multi-purpose projects, will now take over actual dam design.

The organization plans to send six engineers to Europe and the United States annually for two years of study, as part of the program.

New Zealand—The New Zealand State Hydro-electric Department, Auckland, is taking bids for the following power station equipment: June 8, two 50,000 kva. 220-110-11 kv. transformer banks; July 13, one 10,000 kva. synchronous condenser; July 27, two 30,000 kva. synchronous condensers.

Plans and specifications can be obtained from the New Zealand Trade Commission, 1800 K St. NW, Washington, D. C.



***Inflated Housing**—Built near Mexico City, these concrete-shell domes are being used in various combinations to provide a number of unusual designs for homes, schools and utility buildings. The shells are formed by guniting concrete over eight-ounce rubber-coated nylon balloon forms made by the Goodyear Tire and Rubber Co. Timbers over the "balloon" are to hold scaffolding. The buildings were designed by Wallace Neff, Los Angeles architect, for the Airform Construction Co.*

British South Africa—A $92,000,000 power project planned for Northern Rhodesia will include a 300-ft. high dam on the Kafue River and a 750,000 kw. hydro-electric plant. Also planned is a 250-mi. railway line.

Water Supply . . . .

Puerto Rico—The Puerto Rico Planning Board has approved the construction of a $6,581,000 water supply system to serve the metropolitan area of San Juan. The project was planned by Buck, Seifert and Jost, New York City consultants, for the Insular Aqueduct and Sewer Service.

Included will be a 100-ft. high concrete gravity dam on the Rio Grande of Loiza that will back up a 24,000 ac. ft. reservoir. Below the dam will be a hydro-electric plant with two 1,000-hp. generating units, and a pumping station of 40 mgd. capacity. Water will be pumped through 3½ miles of 48-in. reinforced concrete pipe to a new 30-mgd. filtration plant. The job will be the largest of its type in Puerto Rico.

Bridges . . . .

Australia—As part of a plan to catch up with deferred bridge construction of the war years, bids have been called for three major structures to span tidal waters in New South Wales. One—a bridge over the Clyde River at Bateman's Bay—will consist of five fixed steel truss spans, each 120 ft. long, a 90 ft. vertical lift span, and four plate girder approach spans for a total length of 1,008 ft. Contracts totaling $600,000 have already been let.

A 630-ft. bridge is to span the Tuross River near Bodalla. The structure will consist of four truss spans each 120 ft. long, and four approach spans with rolled steel joists.

The third project is a double-leaf bascule bridge over the mouth of Lake Macquarie at Swansea. Providing an opening of 55 ft., it will be equipped with an open steel mesh deck.

Transport . . . .

England—To speed loading and unloading of ships, port facilities at several British cities will be modernized by the British Transport Commission.

At Newport, six 10-ton electric cranes and new railway sidings will enable that port to handle an additional 150,000 tons of iron ore yearly. Two hoists will be recommissioned to double the speed of loading coal so that an extra 600,000 tons can be exported each year.

The commission also announced that a $3,000,000 railway expansion program in connection with a new steel plant at Margam is well under way. The project includes extensive double tracking, relocation and construction of sidings.

PRA to get $435 million for 1949 construction

Congress last week approved and sent to the White House for signing the Independent Offices Appropriation Act for 1949 (H. R. 5214.). The bill supplies more than $435,000,000 of construction money to the Public Roads Administration.

As finally passed the bill provides a total of nearly $485,000,000 in appropriated and authorized funds to government agencies for construction and equipment.

Construction appropriations for PRA are made up of: (1) $427,288,000 to carry out the provisions of the Federal Aid Highway Act of 1944; (2) $7,300,000 for elimination of railroad grade crossings, as authorized by the 1940 act for this purpose; and (3) $1,000,000 to continue construction of the research and testing laboratory at Langley, Va., about 5 mi. from Washington. The $427,288,000 in federal-aid funds is $25,000,000 less than the sum originally approved by the House of Representatives (*ENR* Feb. 19, 1948, vol. p. 235). Testimony at the Senate hearings made it clear that the reduction would have no adverse effect on the highway program for fiscal 1949.

To the Public Buildings Administration, the bill furnishes $500,000 in cash and $19,500,000 in contract authorization for construction of a hospital center in the District of Columbia.

For the Bureau of Community Facilities of the Federal Works Agency, the bill provides $896,250 to be spent on public works in the Virgin Islands. A budget recommendation that the bureau receive $20,000,000 for local advance planning of public works had previously been killed by the House. Instead, the bureau gets up to $675,000 for liquidation of its public works advance planning program.

The bill supplies $10,000,000 in cash and $18,200,000 in contract authority to the National Advisory Committee for Aeronautics to build and equip laboratories and research stations. These sums correspond to the amounts contained in the budget estimates.

Correction

The traffic interchange on the Cabrillo freeway near San Diego, Calif., pictured on volume page 459 of the March 25th issue, was built by the M. H. Golden Construction Co. of San Diego under a direct contract with the State Highway Department. Basich Bros. and Mittry Bros. were contractors for the road work only.

Set route for Penn Turnpike extension

An entirely new route has been approved for the projected 100-mile extension of the Pennsylvania Turnpike eastward to Philadelphia, Governor James H. Duff said last week.

The route will extend almost due east from the present turnpike terminus Southwest of Harrisburg to a point on the Lebanon-Lancaster County line near the town of Denver, and then proceed southeastward to the outskirts of Philadelphia. Gov. Duff said that the right of way will make it possible to eliminate crossroad intersections at grade, and that the turnpike grade will not exceed two percent at any point.

Seven or eight interchanges will be provided to connect with principal highways and urban points along the route.

Extension of the turnpike was authorized by the last state legislature, subject to surveys and approval by the governor and the chief engineer of the state highway department. The Harrisburg consulting engineering firm of Gannett, Fleming, Corddry and Carpenter, conducted preliminary surveys for the highway bureau.

Financing troubles

Announcement of final decision on the new route, however, was made almost simultaneously with the Governor's statement that the state must raise its present four-cent-a-gallon gasoline tax if the present highway building program is to be continued.

Declaring that he will not hesitate to recommend the required increase in the tax "if the highway department tells me that's what we must do," Mr. Duff pointed to increasing construction costs and greatly-expanded repair programs as examples of the fact that present revenues are not adequate to finance the program demanded by state residents.

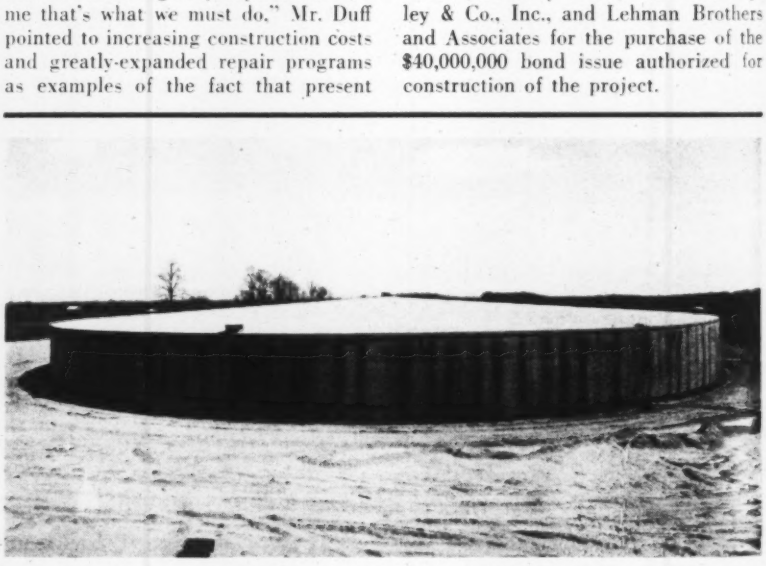
Postpone construction of Delaware bridge

Plans for the construction of the $40,000,000 Delaware Memorial Bridge near Wilmington, Del., have been postponed indefinitely.

The Dravo Corporation of Pittsburgh, Pa., low bidder at $12,896,375 for the construction of the foundations of the two anchorages and main towers of the bridge, has cancelled its contract in accordance with an escapement clause.

Dravo cancelled the contract because of its inability to obtain satisfactory steel commitments. Frank V. duPont, chairman of the Delaware State Highway Commission, was informed. Mr. duPont said that on March 30 the department was able to extend its contract with the Dravo Corporation for construction of the main foundation piers until June 17, subject to cancellation by Dravo on or before April 8, depending upon the corporation's ability to get a commitment for the necessary steel.

Recently a financing offer was received from an underwriting syndicate organized by Alex. Brown & Sons; Kidder, Peabody & Co.; Harriman Ripley & Co., Inc., and Lehman Brothers and Associates for the purchase of the $40,000,000 bond issue authorized for construction of the project.



***Giant Economy Size**—Newly completed at Carmody Hills, Md., is this all-welded steel reservoir, built for the Washington Suburban Sanitary District. The 10,000,000-gal. tank (ENR Oct. 30, 1947, vol. p. 585) is 292 ft. in diameter, and was built by the Chicago Bridge and Iron Co.*

Need for more highway planning, more engineers seen by Paul Hoffman

Retiring head of Automotive Safety Foundation calls for continuing support for highway officials in safety work

In what he said was probably his last informal talk for many months, Paul G. Hoffman, newly appointed Administrator for Economic Cooperation, told 150 top men from automotive and related industries that one of the great needs of the day is for better highway planning and for more engineers in our state highway departments.

The occasion was a dinner for Mr. Hoffman at the Metropolitan Club in New York. He was retiring as chairman of the Automotive Safety Foundation after twelve years of leadership in promoting highway safety. The occasion also was to introduce the new chairman, Alexander Fraser, president of the Shell Union Oil Co. Earlier in the day Mr. Hoffman had resigned as president of the Studebaker Corp. in order to devote all his time to administration of the "Marshall Plan."

Early safety work

Looking back to the time when the automotive industry began to take an interest in promoting highway safety, Mr. Hoffman said that actually our highway system as a whole is no better today than it was in 1936 because construction has not kept up to demand. And, he added, while it is due in part to the curtailment of highway building during the war, in large measure it is due to loss of road funds through diversion, and to lack of proper long-range planning.

Highway officials now realize this just as they realize that safety must be built into highways, Mr. Hoffman said, but they can do little without active support from outside sources such as the automotive industries and the industries that have a large stake in highways, such as the producers of cement, steel and automotive accessories.

It was to provide this kind of support that the Automotive Safety Foundation was organized in 1937. In the intervening years, 100,000 lives have been saved by highway safety campaigns and two and one-half million injuries have been eliminated. "Credit for this goes first to the public officials who have worked for greater highway safety, but the safety program has been spearheaded by Pike Johnson, president of the foundation."

Mr. Hoffman said that in pointing to the lag in highway building he was not advocating an immense spurt in highway construction at this time because that would contribute to the current inflationary trend. What he did want to stress was the need for getting the most out of every highway dollar through better planning and better engineering. To this latter phase, he added, the Automotive Safety Foundation has made a very material contribution through the work now headed by Don Kennedy, vice president of the foundation.

But the state highway departments are handicapped for lack of men, Mr. Hoffman declared. "Right now they lack 10,000 junior engineers because the salaries they can pay are too low to attract young engineers."

Finally, he paid high tribute to Thomas H. MacDonald, head of the Public Roads Administration. "I only hope that in the work I am now undertaking I can be half as wise as Chief MacDonald has been during the 30 years that he has headed highway work in this country."

Beach board establishes mobile research groups

To provide information needed for design of sound coastal structures and economical shore protection, the Beach Erosion Board has established two field research groups. These groups are presently working in the Long Branch, N. J., and Los Angeles, Calif., areas to collect data on the relation between movement of beach material and natural forces such as wind, waves, tides and littoral current.

At Long Branch the movement of 600,000 cu. yd. of material, that was dredged in the normal maintenance of the harbor channel in lower New York Bay, and deposited in 38 ft. of water, is under study. The west coast group is determining the movement of 14,000,000 cu. yd. of dredged sand deposited on the beach at Hyperion, and 1,092,000 cu. yd. of similar material at Sunset Beach.

Both field research groups are highly mobile, being equipped with amphibious vehicles and trailer-mounted shops and field offices. Echo-sounders and several two-way radios are also provided. Other equipment includes wave gages of both depth-resistance and pressure types, selsyn wave direction recorders and special sampling devices to determine the quantity and size of sand in suspension at various water depths.

ALSO RECORDED . . .

South Dakota is now spending about $2,000 a year on soft-drink, beer, whiskey and milk bottles—and not in refunds. State highway department crews charged with retrieving the glass containers from roads and ditches have another complaint, too, according to L. E. Vercoe, maintenance engineer. They get backaches, stooping to get the bottles.

Belmont County, Ohio, believes in consideration even for its involuntary guests. A dull face brick will be used for the new St. Clairsville municipal building to prevent reflected glare from affecting prisoners in the county jail, just across the street.

Psychological note: The Euclid, Ohio, Garbage and Rubbish Department has been renamed the Sanitation Department, and employees are to be titled "sanitation expediters."

The Seattle, Wash., city council was asked to decide what Acting City Engineer James Robertson said is "a matter beyond ordinary engineering practice"—whether maternity cases are "sickness" within the meaning of sick-leave provisions. "We believe . . . maternity . . . is a considered risk (in marriage) and as such should not be granted the same consideration as the usual forms of illness or injury," Robertson told councilmen in a formal letter.

A citizen's planning committee at Lima, Ohio, took the unusual step of criticizing a city department for saving money. The group said sewage treatment plant operations had been curtailed to save power bills. Committeemen commented that if the plant can't be operated at capacity with present funds, rates should be raised.

The trouble is that contractors are too busy and the city makes its plans too hard to read, Toledo, Ohio, city councilmen were told. Alarmed at the dearth of local bids on city construction work, councilmen called in contractors to get an explanation. "Sit tight," builders told the solons, "wait until we aren't so busy and can get more office personnel. Meanwhile, simplify the plans and raise your estimate of costs."

HIGHLIGHTS OF MUNICIPAL DEVELOPMENTS

Summarizing current activities in city engineering and construction throughout the country

Street and traffic problems are uppermost—Santa Barbara wants to raise Gibraltar Dam—Many sewer developments—See delay in Boston air terminal building—Other municipal news

The problem of providing for free flow of street traffic continued to occupy the attention of municipal officers in all urban sections of the country.

Minneapolis, Minn., was nearly ready to start the biggest program announced during the week—eight grade separation projects under an agreement reached among the Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific railroads, the Minnesota highway department, and the city. This agreement culminates 34 years of effort on the part of Fred Paul, city engineer, to get the separation projects under way.

A start will be made this fall with the raising of the Milwaukee and Rock Island tracks by at least one foot and the lowering of Franklin Avenue, so that it will pass under the tracks. Also involved is the raising of Hiawatha Avenue, paralleling the railroad tracks, and building of an overpass so Hiawatha Avenue will pass over Franklin Avenue to eliminate a hazardous six-way intersection. Cedar Avenue, which now crosses the railroad tracks and intersects Franklin Avenue at the same point, will be rerouted to intersect Franklin Avenue one block west. Its relocation will involve the construction of two underpasses.

State and federal money is available for the four viaducts. Cost of the entire project is estimated at $3,500,000.

Other grade separations authorized by the agreement would completely eliminate street-railway intersections so far as the Milwaukee and Rock Island tracks are concerned. Other grade separation projects to be undertaken later are at intersections of the railroad tracks with six other streets.

A $750,000 resurfacing program to eliminate costly and haphazard street repair in Toledo, Ohio, has been recommended by Arnold V. Finch, consulting engineer, in a preliminary report. He said the present repair program of the city street division is wasteful, and urged that it be dropped at once.

The Indiana State Highway Department will build a 7-mile bypass on U. S. 31 along the east edge of Kokomo, Ind., this year, to divert traffic from Washington Street, and the main business district. Two bridges will be built. Some 60 houses will have to be removed to make way for the project.

Smoke Control

The Akron, Ohio, City Council passed an ordinance creating the positions of two smoke inspectors, to enforce a new smoke-abatement program. Smoke Regulation Engineer B. H. Bruce said his department expected to make approximately 4,000 inspections a year, concentrating on commercial and industrial installation and inspections of equipment in operation, as required by the ordinance, while the heating engineer in the building inspection department will handle only heating installations in residences.

Mayor Aloys P. Kaufmann of St. Louis, Mo., signed two ordinances designed to lessen the emission of fly ash and to control the amount of air pollution from industrial operations. Since both of the measures carried emergency clauses they went into effect immediately, except that all industrial plants burning fuel in suspension have been granted two years within which to bring their stacks into compliance through the installation of needed equipment.

The Los Angeles, Calif., district attorney's office ordered that all burning in the 44 public dumps in Los Angeles County must cease by July 1 to abate the smog nuisance. Simultaneously, the Los Angeles Bureau of Water and Power made objections to the sanitary fill rubbish disposal program proposed by the city of Glendale on a Glendale-owned site Los Angeles.

Add Apologies—One more in the list of construction signs in use to explain work under way is this one, telling of water-main construction in downtown Phoenix, Ariz.

Airports

It is now said that the multi-million dollar Airport Terminal Building, Boston, Mass., a key project in the expansion of the port at East Boston, may not be built for several years. Aviation officials believe that the airport can and should get along for some time without spending another $12,000,000. The result may be some drastic changes in the Boston Airport plans, and further work postponed until costs are lower.

Purchase of 404 acres at a cost of $838,000 to expand the Los Angeles, Calif., municipal airport has been announced. The new area eventually will be the site of two new take-off runways. Bids will be accepted soon for grading all airport property west of Sepulveda Blvd., approximately 10,000,000 cu.yd., at a cost of about $2,000,000. The federal government has allocated $1,000,000 for the grading and Los Angeles will contribute a like sum.

Another major Los Angeles airport improvement is planned. Bids will be opened April 30 for installation of a fog dispersal system to begin operation in December. The system, commonly known as FIDO (fog, intensive dispersal of) was used in England on military fields during the war and this will be the first commercial installation.

Denver Plan

A co-operative effort by Denver, Colo., backed by the municipal government, the Chamber of Commerce, prominent builders, contractors, architects, manufacturers and suppliers—is being effected to meet the heavy demand facing the building industry.

The Denver Plan will center in the Denver Building Institute, a million dollar, modernistic, building products and service center with 60,000 sq. ft. of floor space which will be constructed, beginning this spring or early summer, in the heart of the city on a main intersection where thousands of automobiles pass daily. Into this building will

go the best the building industry has to offer, making it a complete cross section of the entire building field.

In the building 36,000 sq. ft. of floor space—including a spacious mezzanine—will be devoted to permanent exhibits of building materials and supplies. Also in the exhibit area will be a home planning division, sales conference rooms, and consultant services.

Sewer Developments

A contract to construct a lateral sewer system for Arcadia, Calif., has been awarded to Mike Radish, of Glendale, Calif., on his low bid of $2,596,325. The award was one of many actions during the week as local officials sought to solve their disposal problems. Other developments included:

Eugene, Ore., received the final report on a proposed $684,000 sewage disposal plant; Councilman George J. Young of Buffalo, N. Y., said he is preparing a resolution for consolidation of the Buffalo Sewer Authority with the Buffalo Department of Public Works as an economy measure.

A Cuyahoga County Committee on Sanitation is being organized at Cleveland, Ohio, to consider remedies for the inadequate sewers in the city and its suburbs. Cleveland Heights is being surveyed to learn causes of flooded basements. Improper sewer connections are believed to be a contributing cause. About 90 separate projects to cost more than $7,000,000 are said to be needed to renovate the city's storm network.

Chapel Hill, N. C., approved a $260,000 bond issue, largely for extension of its sanitary sewer system, and a $20,413,000 sewer-construction program for the Louisville, Ky., area over the next 10 years was recommended in a survey by Metcalf & Eddy, Boston consulting engineers, which the Metropolitan Sewer District has released.

City Planning

St. Louis, Mo., established minimum permissible standards for new housing units. The minimum area per person in each room has been cut from 70 to 64 sq. ft., and other provisions are that at least one room in each dwelling must have at least 125 ft. of floor area, and that all habitable rooms must have electric lighting.

Recent building code developments include: The Ohio Board of Building Standards considered requests for changes in the code, to allow wider use of materials and reduce construction costs; a political fight between the mayor and city council stalled proposed relaxation of the Los Angeles, Calif., building code. A major provision of the relaxed code allows a considerably greater number of apartments per square foot of lot area. Opposed by the city planning commission, the new code was passed by the city council and promptly vetoed by Mayor Fletcher Bowron.

Builders of Milwaukee, Wis., will try to rewrite dwelling house portions of the city's proposed new building code in an effort to correct alleged defects in the present law.

Home Made—When the Seattle, Wash., Engineering Department called bids on four new street-flushers a year ago, it found the price too high, decided to build the units in its own shops. Results—at a saving of $575 per unit—are now at work on city streets. Pump, powered by six-cylinder gasoline engine of its own, is mounted in rear of 1,800 gal. capacity truck, and can maintain a 50 lb. pressure with three shoes operating without straining the motor unit. All controls are dashboard mounted, along with pressure warning gages and other instruments.

Parking Progress

Cleveland, Ohio, traffic officials are planning to provide 125 off-street parking areas in neighborhood business centers at a cost of $10,000,000, if an experimental small-scale project proves successful. For this, the city has purchased a site near the West Side Market area, which will be resurfaced and opened to shoppers this year. Eventually voters will be asked to approve a bond issue to finance the full program.

About 400 parking meters will soon be installed in downtown Sandusky, Ohio, and a parking authority was created at Syracuse, N. Y., empowered to issue $1,000,000 in bonds to finance construction of parking facilities. Binghamton and Elmira, N. Y., also, authorized such authorities.

New Jersey legislative measures would permit municipalities to lease land and buildings for parking purposes, and authorize the State Highway Commission to acquire unimproved land abutting highways for use as parking strips.

Water Supply

In Santa Barbara, Calif., the city water superintendent will readvertise for bids to raise Gibraltar Dam on the Santa Ynez River, which impounds the city's main water supply. Last year, bids were to high.

The Quabbin Reservoir of the Boston Metropolitan District at Ware, Mass., was filled to its full capacity for the second time in its history. The capacity is 415,000,000 gallons.

Columbus, Ohio, appropriated $350,000 for a circular settling system in the Dublin Road Water Purification Works, to increase the plant's capacity by more than one-third. Meanwhile, facing a possible shortage, the City Council has been asked to determine whether the city should cut off all outside users, or whether Columbus residents and these users should face shortage together.

Caught between fixed revenues and the need for expanding construction, the New Orleans, La., Sewerage and Water Board, headed by A. Baldwin Wood, will request the state legislature for permission to increase water rates (currently said to be the second lowest in the country) by about 50 percent.

The multi-million dollar water improvement program of Philadelphia, Pa., faces possible collapse, officials have disclosed, unless a sharp increase in existing water rates makes sufficient additional funds available. The disclosure followed the announcement that less than $2,000,000 remained of an original $18,000,000 appropriation to rehabilitate the water system.

Random Lines *from an editor's notebook . . .*

. . . . In which are detailed West Virginia's efforts to provide good secondary roads for its back-country citizens

Charleston, W. Va.—The West Virginia State Road Commission recently took another long stride forward in its program to get its back-country citizens "out of the mud" when it awarded five contracts for secondary road work.

The contracts, totalling about $330,300 for 20.4 miles of work that will be chiefly grading, draining and installing traffic-bound bases, was a small part of an emergency $10,000,000 improvement program.

Some measure of the gravity with which the state is approaching its secondary road problems can be gained from a referendum to be taken this November on a $50,000,000 bond-issue to be earmarked solely for "construction and reconstruction" of these traffic arteries. Meanwhile, the emergency program, together with federal-aid allotments, make some $12,000,000 available for the immediate work.

Most of the new construction will be grading, draining and traffic-bound base courses which, eventually, will receive a road-mix or plant-mix "black-top" surface. A great deal of the work will include strengthening existing and nearly worn out gravel bases with additional gravel and binder. Also, several miles of existing traffic-bound bases will be black-topped under the program.

Two-lane highways constructed under the program will have a graded section 26 ft. wide, including allowances for drainage ditches, and a 16-ft. traffic-bound surface. One-lane roads will have 20-ft. graded sections, with 8 ft. of traffic-bound surface. Grades up to 14 percent will be permitted for short distances.

In fact, one of the chief aims of the road design is to keep the road gradients within reason, without increasing the grading quantities too much. This is based on a decision to make the available funds go as far as possible in this rolling and mountainous country where current costs of grading, draining and traffic-bound base for work of this nature averages $22,000 per mile. Despite the fact that the state road commission is 50 percent undermanned in both field and office personnel, plans are being kept prepared reasonably well in advance of lettings.

Bids were received on a number of projects on this secondary road program last year, but so many were rejected, due to unreasonably high offers, that much of the work will be and is being done by state maintenance forces. In fact, out of 324 projects now programmed, only 71 (350 mi.) will be offered for contract, with the remaining 253 projects, involving 900 mi. of construction and reconstruction, proposed to be done by state forces.

Approval of the $50,000,000 bond issue this fall will assure the continuation of West Virginia's long-range program for improving its secondary road system.—*J. R. C.*

To build new bridge over French Broad River

The North Carolina Highway Commission has let a contract for the construction of a 1,360-ft bridge across the French Broad River at Asheville, N. C.

The contract went to the Bowers Construction Co. of Raleigh, N. C., whose low bid totaled $811,817.04. The bridge at its highest point will rise 92 ft above the river level and will contain a 48-ft roadway, divided into four 12-ft lanes; and will have 6-ft. sidewalks.

Health engineering dept. reorganized in Penna.

The Pennsylvania State Sanitary Water Board's anti-pollution drive has been intensified with a complete reorganization of the Bureau of Engineering, Department of Health. Norris W. Vaux, state secretary of health and chairman of the water board, in announcing the reorganization said the change will consolidate the bureau's operations and facilitate the clean stream program.

The bureau has been divided into four branches, three of which are to be headed by division engineers, and the fourth by an assistant chief engineer. There have been a reassignment of some engineers and new personnel.

H. G. Knox, of New York, a graduate of the United States Naval Academy will oversee the new setup. He served in the Navy for 18 years, resigning in 1920 as a commander in the Construction Corps.

Howard E. Moses, chief engineer and director of the Bureau of Engineering since 1937, advances to the newly created position of consulting chief engineer. He has been in the department of health since 1908.

J. R. Hoffert, assistant chief engineer, who has been with the bureau since 1919, has been advanced to succeed Moses as chief engineer. Hoffert has been an official of the Sanitary Water Board since 1927.

L. D. Matter, who has served as a district engineer since 1923, has been advanced to assistant chief engineer.

Charles H. Young, L. S. Morgan and F. B. Milligan, all 20 year employees of the engineering bureau, have been named new division engineers. Young heads the sewerage division. Morgan the mine wastes division and Milligan the industrial wastes and silt-control division. J. R. Harvey, now assistant engineer in the Philadelphia district, becomes district engineer in the Meadville district.

Before and After—Easy curvature, improved sight distances, grades up to 14 percent and traffic-bound surface typify contemporary secondary road construction in West Virginia, as evidenced in these views of a project completed by state maintenance forces.

Canadian development of Columbia River starts

Canadian development of the Columbia River was started in March with the awarding of a $25,405 contract for foundation investigation work at the Wardner, Plumbob and Torrent damsites on the Kootenay River in British Columbia to Western Water Wells of Calgary, Alta.

This is in connection with an international project to utilize the entire Columbia River system for power, irrigation and flood control.

Preliminary investigation of the Upper Kootenay was done by Canadian federal water power engineers.

U. S. circuit court rules on night watchman's pay

A night watchman on a highway bridge construction job is engaged in interstate commerce and is entitled to overtime pay under the Fair Labor Standards Act, it was ruled April 5 by the United States Fourth Circuit Court of Appeals.

The ruling reversed a decision of a lower court at Raleigh, N. C., in the case of D. R. Bennett vs the V. P. Loftis Co. The circuit court decision said that to hold that the watchman was not engaged in interstate commerce "would require a narrow, strained and technical interpretation of the act," and that the contractor's contention that the bridge project, across the Upper Little River in Harnett County, N. C., did not constitute interstate commerce because no cars passed over it while the project was under way "overlooked the fact the new bridge was purely and simply a replacement of the old."

Name advisory group for plywood industry

Appointment of a softwood plywood industry advisory committee to represent all classes of producers was announced last week by the Office of Industry Cooperation.

Industry representatives after considering the requirements for new housing as submitted to them by government officials, and in view of an anticipated production of more than 1,800,000,000 sq. ft. of softwood plywood during 1948, say that plywood requirements for the housing program will be met. Department of Commerce estimates indicate that 981,000,000 sq. ft. of housing grades of softwood plywood are needed for the 1948 program.

OK New Madison Square Garden

Construction of a new $25,000,000 Madison Square Garden in New York City moved a step nearer realization last week when Governor T. E. Dewey signed a bill authorizing the Triborough Bridge and Tunnel Authority to build the huge structure.

Seating 25,000 people, the new Garden will be the world's largest combination convention hall and sports arena, and will also provide a parking garage for 2,000 automobiles.

The new structure will occupy most of two city blocks just west of Columbus Circle, and will bridge 59th St., a main crosstown traffic artery. Built by the Triborough authority the building will be leased to the Madison Square Garden Corp. for operation.

Actual construction is still some time away, although the authority hopes to have the building completed by late 1950. Cost estimates made 18 months ago when the structure was first proposed (*ENR* Nov. 21, 1946, vol. p. 690), came to $20,000,000, but even the additional $5,000,000 provided in the bill may prove insufficient when final plans are completed.

Negotiations of a lease and approval of the City's Board of Estimate are awaiting completion of these plans and final estimates. After that property must be acquired and tenants on the site resettled.

In addition to the 25,000-seat sports arena, the structure will provide a convention and exhibition hall with 200,000 sq.ft. of floor space. A large swimming pool and a 60 x 80 ft. diving tank, raised and lowered hydraulically, are also planned. Escalators will serve each seat level.

Industrial building volume betters early forecasts

The rate at which contracts for industrial buildings are being awarded is slightly higher than forecasts by *Engineering News-Record* early in January, a survey indicated last week.

This journal's Business News Department forecast a general increase in industrial construction of 16.5 percent for 1948, in comparison with 1947. This figure, forecasters said, would be about 6 percent below 1946 totals.

As of mid-April, a total of $301,775,000 in industrial construction contracts had been recorded by this journal—almost exactly 20 percent over 1947, and only 5 percent below 1946.

Oregon has new statute for ice sanitation

A law for regulating the manufacture and handling of ice has recently gone into effect in Oregon. It empowers the state board of health to supervise sanitation in ice factories.

The law requires a permit to operate an ice plant, sets up procedure for permit revocation, calls for inspection at least once every six months, and requires that "premises where ice is produced, stored and handled should be maintained in a clean condition," nor shall ice "which has been contaminated in a manner which shall cause it to be unfit for human consumption be sold for that purpose."

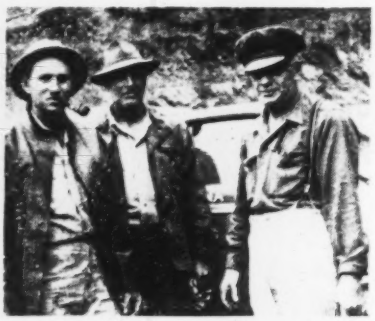
***Biggest for Buses**—Said to be the world's largest bus terminal, this new structure was recently dedicated at Cleveland, Ohio, to serve three operating companies of the Greyhound Corporation. Costing more than $1,000,000, the structure is two stories high, 250 ft. long by 150 ft. deep, and provides 20 docks for bus loading, as well as waiting rooms, ticket offices, lounges and other facilities.*

MEN AND JOBS

O. L. Kipp (left), new president of Mississippi Valley Conference of State Highway Departments, discusses program with R. C. Keeling, past president, at annual meeting in Chicago. Mr. Kipp is assistant commissioner and chief engineer, Minnesota Department of Highways, St. Paul, and Mr. Keeling is Kansas state highway engineer, Topeka, Kan.

M. K. Ludin, Minister of Public Works for Afghanistan, who is planning public works in his country, is visiting here. A civil engineer graduate of Cornell University, 1936, he served with the U. S. Bureau of Reclamation, at Denver, Colo., until 1938. He joined the Ministry of Public Works in 1939 and became head in 1946 (ENR Feb. 26, Vol. p. 314).

Baltimore's water engineer, Leon Small, studies construction progress reports on the first contract for driving a 17½-mile water tunnel to develop the Upper Patapsco River supply.



Bill Jones, rigger superintendent; Charlie Beatie, general superintendent; and "Doc" Kramer, first aid attendant, of National Construction, builders of the Allatoona multi-purpose project near Cartersville, Ga.

Two laboratory trucks are used by the field laboratory unit of the Tennessee Stream Pollution Control Board in its survey of city and industrial sewerage and waste disposal systems. Left to right: S. Larry Jones, principal sanitary engineer, Nashville; H. Dalton Tomlinson, engineering aid, Lynville; John Lee Myers, engineering aid, Nashville; Joseph M. Dennis, Jr., sanitary engineer, Nashville; Robert H. Bushey, Jr., chemist, Nashville; Carlton D. Moore, engineering aid, Chattanooga; R. P. Farrell, director of division of sanitary engineering of Tennessee Department of Health, Nashville.

Howard E. Robbins, who has been acting director of Reclamation Region No. 5 for seven months, has been named director of that region comprising Texas, Oklahoma, most of New Mexico, and parts of Kansas and Colorado. With headquarters at Amarillo, Tex., he is in charge of the investigation, planning, construction, operation and maintenance of reclamation projects for irrigation, hydro power, and the allied benefits of multiple-purpose development of river basins.

A career engineer with the Bureau of Reclamation, Mr. Robbins' previous assignments included that of project engineer on the Valley Gravity project in southeastern Texas, construction engineer on the W. C. Austin project, and office engineer on the Colorado Big-Thompson project in Colorado, and on the Salt River project in Arizona. He also served in the designing section of the Office of the Chief Engineer at Denver at the time Hoover Dam was being designed.

Gordon L. Burt has been appointed city manager of Hayward, Calif. He has been an East Bay municipal utility district engineer.

H. H. Palmer, former Kentucky state highway department director of maintenance, has rejoined the Ohio highway department to be in charge of contract construction on state roads in southwestern Ohio.

William K. Brittain and **Claude T. Davis** have been appointed district engineers in the Montana highway department. Brittain, formerly resident engineer at Glendive, has been made head of the new District 11. Davis was promoted from resident engineer to district engineer at Miles City. Brittain has been with the department since 1927 and Davis since 1930.

William Q. Reeves has been promoted to construction engineer on the Tucumcari Irrigation Project. He had been acting construction engineer since Feb. 2, transferring from the W. C. Austin project of the Reclamation Bureau in Oklahoma. He has been with the bureau since 1934, when he started as a rodman on the Boulder Canyon project in Nevada. He subsequently worked on projects at Littleton, Montrose and Grand Lake, Colo., Cisco, Utah, and Kremling and Denver, Colo. He served as draftsman and engineer on the Colorado-Big Thompson trans-mountain diversion project in Colorado and was transferred from there to the Austin project in 1944. As construction engineer at Tucumcari, he will supervise construction of canals

and lateral ditches to serve the remaining 22,000 acres of the 45,000-acre project.

Edmund R. Ricker, Hamden, Conn., has been appointed to the newly-established position of city traffic engineer of New Haven, Conn. A veteran, he was graduated from the University of Vermont and did graduate work in civil and traffic engineering at Yale University.

Clarence V. Windsor, Anderson, Ind., chief engineer of the Greenfield District for the Indiana State Highway Department the last three years, has resigned to engage in his own engineering and contracting business in the city of Anderson.

Oliver A. Bakhaus is the new city manager of Lexington, Ky.

The Ballinger Company, engineers and architects, have a new office at 121 North Board Street, Philadelphia 7, Pa., and desire manufacturers' catalogs.

Milo B. Wiley has been appointed sanitation superintendent of the Syracuse, N. Y., department of public works, succeeding the late Harry Yarwood. Mr. Wiley formerly was sanitation foreman and has been a member of the public works department since 1919.

S. W. Hodgin, Richmond, Ind., city engineer for 20 years, has retired because of failing health, and is succeeded by **Ed Ross,** superintendent of the sewage disposal plant.

Royal W. Thompson, superintendent of streets, has been offered the post of director of public works at Hartford, Conn., subject to his acceptance and the passage of an ordinance establishing the new position. Mr. Thompson was with the Connecticut Highway Department for 18 years and is a registered professional engineer. He has headed Hartford's street department since April 1, 1945.

James H. Bookedis, veteran and civil engineer, has been appointed sanitation superintendent of Indianapolis, Ind., succeeding **Ferd J. Ludzack,** acting superintendent of the plant for the last two months, who will return to his post as plant chemist. Ludzack assumed the job with the resignation of **W. H. Frazier.** Mr. Bookedis, a graduate of Purdue University, was a lieutenant colonel and was deputy commander of maintenance and supply at the Alamagordo, N. M., atomic bomb installation.

C. Arnholt Smith, center, state highway commissioner for San Diego and Imperial counties, assists at the ribbon cutting at the recent opening of the $3,500,000 Cabrillo Freeway in San Diego, Calif. Cutting the ribbon is Arthur H. Marston, son of the late George W. Marston, originator of the freeway idea. At the extreme right is Edward A. Wallace, district engineer for California's highway department, and next to him is Harrison Baker, a state highway commissioner. At left is Admiral C. A. Blakeley. Cabrillo Freeway provides a 7½-mi. uninterrupted access to the city's center. The project was designed by city and state highway department engineers. Contractors were Basich Brothers Construction Co. and Mittry Brothers Construction Co., both of which are located in Los Angeles, Calif.

W. W. Caldwell, president of Caldwell-Scott Construction Co., Fort Lauderdale, Fla., is now spending much of his time in South America where his firm has a number of large projects under way.

W. O. Phillips, purchasing agent; Doug Haile, office manager; and Al Benham, paymaster, on the porch of the field office of the district engineer at the Allatoona Dam, the multi-purpose project now under construction in the vicinity of Cartersville, Ga.

Franklin R. McMillan (left) of the Portland Cement Association, Chicago, looks on as Stanton Walker (right) retiring president of the American Concrete Institute congratulates Robert F. Blanks newly-elected president of the institute. Walker is director of engineering for the National Sand and Gravel Association. Blanks is chief of research and geology for the Bureau of Reclamation.

J. A. Dunn, of Hume Pipe of New England, Swampscott, Mass., (left), newly elected president of the American Concrete Pipe Association, receives a hearty handshake and best wishes from the retiring president, F. L. Johnson, of the Concrete Conduit Co., Colton, Calif.

Middle Rio Grande work opposed by Tex. and Colo.

Texas and Colorado have gone on record as opposing the proposed Middle Rio Grande project in central New Mexico, approved by the governor of New Mexico. To cost an estimated $93,000,000 on the basis of early 1947 prices, it would be a joint U. S. Engineer-Bureau of Reclamation construction project.

The bureau would take over, rehabilitate and operate the Middle Rio Grande Conservancy District, under which about 80,000 acres are now being irrigated. Flood control features to be built by the Army engineers include: Three dams, capable of impounding a total of more than 2,000,000 acre-ft., at Chifla, on the Rio Grande just south of the Colorado-New Mexico line, at Chamita, on the Chama River just above its junction with the Rio Grande, and on the Jemez River just above its junction with the Rio Grande; general improvement of levees and the Rio Grande channel; a floodway to protect the Bluewater-Toltee Irrigation District; and a floodway to protect the town of Hot Springs, just below Elephant Butte Dam, from flash floods.

Both the engineers and reclamation bureau have recommended the project in reports completed late last year. It was on these reports that the governors of the three states in the Rio Grande Compact submitted their views.

Views of Governors

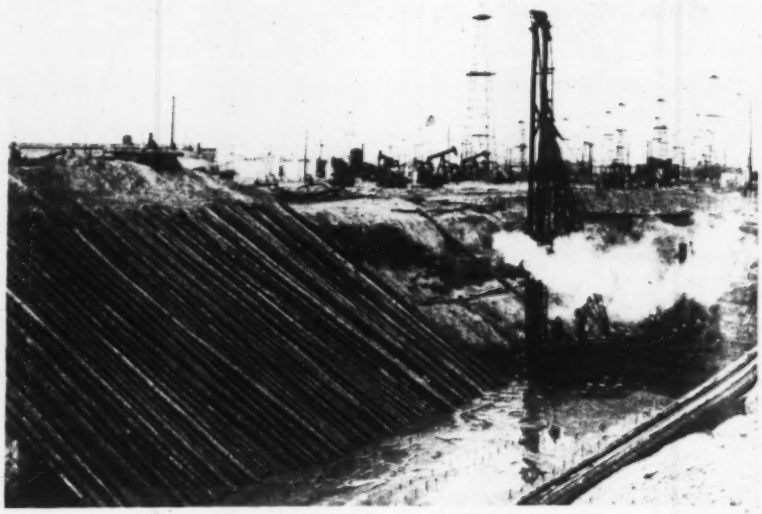
Gov. Beauford H. Jester, of Texas, called for a federal restudy of the proposal from the angle of Texas interests.

He objected to the proposed Chifla and Chamita Dams, but approved the proposed Jemez Dam.

Gov. Lee Knous, of Colorado, objected primarily to the proposed Chifla Dam, and suggested instead a dam on the Rio Grande in Colorado. He asked that the federal government maintain the levee systems when flood releases of water from reservoirs were being used to deepen the river.

Gov. T. J. Mabry, of New Mexico, approved the reports, recommended that Congress immediately authorize the entire project, asked appropriations on the channel rectification phases and for the Jemez and Chamita reservoirs.

New Mexico State Engineer John Bliss reported failure to carry out the project would result in the middle valley facing problems of reduction in field crops, progressive increases in flood damages and inability to deliver water to the Elephant Butte district in accordance with terms of the Rio Grande Compact.



***Support**—Some 2,700 of these 55-ft. wood piles were driven on 3-ft. centers in three double rows to support a double-barrelled concrete discharge conduit for cooling water from the Southern California Edison Co.'s Terminal Island steam station at Long Beach. Each 11 x 13-ft. section of the conduit will be heavily reinforced to withstand the 750-psf. loading imposed by earth backfill and possible future warehouse and pier construction. Macco Corp. is contractor.*

Big building program for Camp Pendleton

A $127,000,000 construction program at Camp Pendleton, near Oceanside, Calif., is proposed by the U. S. Marine Corps, which has submitted plans to the Navy's Bureau of Yards and Docks at Washington.

Lieut. Commdr. M. H. Aubrey, in charge of the Pendleton public works department, prepared the plans which call for replacing the temporary wartime-built structures with permanent buildings. The construction work would be continued over a 5-year period and is dependent upon an appropriation by Congress. One-fifth of the total cost will be asked each year, starting July 1, 1948.

Pendleton is the Marine Corps' largest base. The 132,000-acre reservation has a capacity for 25,000 men. It is the principal west coast training and replacement center and also headquarters for the First Marine Division.

The construction work proposed calls for barracks, mess halls and other permanent structures. It is in line with the policy to turn Pendleton into a permanent base where among the permanent buildings recently completed are such as warehouses, cold storage facilities, bakery and storehouses. Detailed plans would be completed and construction bids called for on the first portion of the program soon after the appropriation is assured.

Capacity to be raised at Canadian hydro plant

Plans have been announced by the Consolidated Mining & Smelting Co. of Canada, Ltd., Trail, B. C., for the installation of an additional turbine and 30,000 kw. generator at its Brilliant power plant No. 5 on the Kootenay River near Nelson, B. C. Although installation of the new unit is not planned until next year, construction of a 16-mile power line between Brilliant and Trail will be started in the near future to handle the additional load.

At present, the power plant consists of two 30,000 kw. units, with provision for two more. Penstocks, gates, foundations, switchboard, etc., are already provided, and the new water wheel and generator will be installed in one of the spare settings.

Charleston, S. C., Terminal

An authority with power to improve the terminal facilities of Charleston, S. C., is proposed in a bill recently introduced in the South Carolina house of representatives. The bill points out the traffic congestion, blighted development of residential and business property, dangerous grade crossings and other undesirable features resulting wholly or partially from the indiscriminate location and use of numerous passenger and freight terminals in Charleston.

Sanitation engineers consider effects of garbage disposal through sewers

Maryland-Delaware group hears kitchen-sink disposal units might save communities money, but would increase plant problems

If every home in a community possessed a kitchen-sink garbage disposal unit, the community would save some money, although its sewage treatment plant operations would require some readjustment, sanitary engineers were told last week.

Meeting at Baltimore for the 21st annual conference of the Maryland-Delaware Water and Sewage Association, the engineers in a two-day session also heard discussions of water treatment, pollution control, storm sewer design, refuse collection and other matters.

Ralph E. Fuhrman, superintendent of the Blue Plains sewage treatment plant at Washington, D. C., declared himself "puzzled" by the reluctance of many communities to permit the use of home-disposal garbage units, in view of what he called "the practical success and convenience of the machines."

"If all garbage were to be ground," he said, "domestic sewage loads would be increased 30 percent or less on a basis of biochemical oxygen demand, and 50 percent with respect to suspended solids.

"But as a counterbalance to the increased costs of sludge treatment, digester gas production might be expected to rise 50 percent, and for a plant not using the digestion process the greater solids load might aid heat recovery in sludge-incineration processing.

"Water required for grinding is only about 1 gal. per capita per day, "he added." No problem of sewer clogging can arise unless the kitchen grinders are misused to grind china, glass or hard seafood shells.

"With household units in all homes of a community, that community could save money by combined treatment of sewage and garbage. This economy would be achieved by eliminating manual garbage collection (costing $1 to $4 per capita per year)."

Disposal of mixed refuse

Disposal of mixed refuse by truck collection and incineration was discussed by C. V. Joyce, refuse engineer, Washington Suburban Sanitary Commission. Contrasting today's methods with the trying conditions under which the commission started service to its area in Montgomery County, Md., during the war, he described how a crew of five men with an inclosed, self-packing truck covered a route of 500 houses per day, collecting about 7½ tons of refuse and garbage.

Refuse is collected twice weekly, and ashes are picked up separately once a week through the heating season, he reported. More than 17,000 dwelling units of about 65,000 population are served at a charge of $1.50 per month per unit.

Collection trucks deliver to a central incinerator an average hauling distance of 2.7 mi. from the collection areas, he said. The incinerator, completed in 1946 at a cost of $250,000, is of pit and monorail design with two automatic stoking furnaces which can burn more than 50 tons of mixed refuse in 8 hr. The rate charged for disposing of refuse is $2 per ton.

By a constitutional amendment adopted at the meeting, the term of the present officers is extended six months beyond June 30 to cover an interim period in making a changeover to an association year corresponding with the calendar year. The new president elected at the meeting, R. R. C. Willson, superintendent of the water department, Hagerstown, Md., will take office Jan. 1, 1949. Until that date, J. W. Engle, Washington, D. C., will continue in office as president of the organization.

Seek new specifications for Oregon schools

High construction costs have upset the building program of the Oregon state board of higher education to such an extent that it is requiring architects to alter specifications to bring contractors' bids down.

An example of revisions made under this policy is a women's dormitory at the University of Oregon, for which a top estimate of $1,825,000 was made to include construction, engineers' and architects' fees, furnishings, fixtures and landscaping.

Bids submitted last July for general, mechanical and electric contracts totaling $1,660,249 were rejected as too high. Architects were instructed to revise the specifications to lower costs without reducing the size of the building or the number of students it would accommodate.

New bids were called for and the board has just awarded contracts totaling $1,293,532. The general contract was awarded to W. C. Smith, Inc., Portland, on a bid of $1,049,442.

Reduced costs were brought about mainly by simplification of architecture. Rooms were cut in size and the capacity per unit stepped up from 14 to 20 students. Twelve of fourteen guest-rooms were eliminated.

Although the revised plans call for housing of nearly 100 more students than the original unit would have held, there has been no increase in overall area in the new plans.

Consider radiant heat for Boston airport

Engineers at the Logan International Airport in East Boston, Mass., are considering the use of radiant heating techniques to melt ice and snow off the new field's long runways.

Ice and snow would be melted from the surface of the runway by a subsurface network of coils installed carrying water heated to 350 to 400 deg. F., piped from the airport's central boiler plant. Engineers say that this device would have prevented a recent airplane wreck at the port.

Designers of the system claim it will permit uninterrupted use of the runways at all times. The estimated cost of equipping a 6,000 by 150-ft. runway is $225,000, and the cost of operation over a normal winter is placed at about $6,500. These figures are based on the use of heat from the central boiler plant. If a separate boiler plant is required, the cost was estimated at about $400,000.

New policy is decided for Minnesota airports

Two important changes in policy for the development of airports in Minnesota have been approved by a state legislative advisory committee. Acting on recommendations of Leslie L. Schroeder, state commissioner of aeronautics, the group, made up of members of the state legislature and headed by Gov. Luther W. Youngdahl, decided that:

The state hereafter will contribute two-thirds of the cost, as against one-third by the municipality, to promote construction of low-cost airports. Under the previous policy the state participated on a 50-50 basis.

Specifications may be set up for single-strip landing fields. Previously, at least two strips were required.

The committee allocated $919,325 to 26 state airports for grading, surfacing of runways, and planning, and authorized Schroeder to make expenditures not to exceed 15 per cent of the state's share for any one project.

Report recommends new N. M. irrigation project

The Albuquerque area office of the Bureau of Reclamation is now completing a survey and report recommending that the bureau undertake the proposed Vermejo irrigation project in northern New Mexico. John L. Mutz, area engineer, said the report should be in the bureau's Amarillo regional office soon. He hopes it will reach Washington sometime in May.

Mutz said the report will recommend that the bureau take over the irrigation district now supplied with water by the Maxwell Irrigation Co., a private firm. The company, which has six small dams and reservoirs on the Vermejo and Chico Rico rivers, supplies water for about 6,500 acres in Colfax County, N. M.

The report will recommend expenditure of about $1,500,000 to enlarge and rehabilitate the existing dams, and to rehabilitate and improve the ditches and other structures. The project would provide water for about 7,500 acres. Original proposals for construction of a new and larger dam to furnish water for 22,000 acres were abandoned because it was felt the cost would be greater than water users could repay.

Plan pollution survey of Rhode Island river

A survey will soon be made at Woonsocket, R. I., looking to expansion of plant facilities to abate pollution of the Blackstone River. The amount of untreated waste discharged into the river at that point is estimated by the state health department to exceed the capacity of the Woonsocket treatment plant by about 5,000,000 mgd. A major problem is the handling of industrial wastes from about 34 plants not at present connected with the sewer system.

To speed irrigation in Coachella Valley

Irrigation of 90,000 acres in California's Coachella valley will be speeded up and costs cut with a power switchboard donated to the Coachella valley water district by the War Assets Administration.

The switchboard, designed for a ship's engine room, is being converted into a semi-automatic remote control for lateral ditches from the 120-mi. canal that diverts 1,350 sec. ft. of water from the Colorado River to grapefruit, date and vegetable ranches.

Black Canyon project resumes after shutdown

After a shutdown of several weeks caused by a shortage in Bureau of Reclamation funds, three Idaho construction companies have resumed work on the Black Canyon irrigation project in the southwestern part of the state. The contractors have agreed to wait for payment out of the 1949 budget.

Project funds were exhausted because estimates made several years ago have never been revised. A supplemental appropriation of $800,000 to carry through all contract work to June 30 is pending before Congress, while an additional $1,700,000 will be needed to complete the project.

Contractors are Vernon Bros. and Humphrey & Ketchen, Boise, building a pumping plant and laterals, respectively, and S. H. Rither, building transmission lines.

Study $100 million plant for Aluminum Company

Development of a major manufacturing plant on the Pacific Coast involving a 450,000 hp. power development at Bute Inlet, 150 miles north of Vancouver, has been proposed by the Aluminum Company of Canada. Although complete details are lacking, it is understood that the entire project will cost over $100,000,000.

The British Columbia development has been decided upon as a result of continuing hydroelectric shortages in Quebec and Ontario where the Aluminum Company maintains large plants. Negotiations with the provincial government have been in progress for some time, and the government has now reserved prospective power facilities in the area around Bute Inlet. Preliminary investigations show that more than 2,000,000 hp. are available there.

Two rivers, the Homathko and the Southgate, empty into Bute Inlet within three miles of each other at the head of the bay. Both rivers are mountain torrents with headwaters in a series of big lakes at high altitudes 50 miles from the coast.

Largest of the lakes tapped would be Chilko, some 3,800 ft. above sea level and 70 square miles in area. Diversion of Lake Chilko waters into the Homathko would be through a 9-mile tunnel with a drop of 1,100 ft. It is estimated that 400,000 hp. could be developed at the tunnel outlet, and that an additional 800,000 hp. could be picked up from the tributary-swollen waters of the Homathko between this point and the sea.

Move heavy equipment over Canadian lake ice

Heavy equipment for use on the Snare River hydro electric project in Canada's Northwest Territories was successfully hauled over the ice of Great Slave Lake in the last days of March and has safely reached the dam site.

The equipment, valued at about $400,000, and including an 8,000 hp. turbine, and electrical generator and transformer, weighed 220 tons in all and was hauled on 25 ten-ton sledges by tractors in train formation. Delivered by rail to Grimshaw, Alta., it was first hauled by truck along the new road to Hay River on the southwest shore of the lake. Transferred there to the sledges, it was hauled for 325 miles over the ice and finally 95 miles northwest from the town of Yellowknife to the power site.

During the critical crossing of the lake ice, aerial reconnaisance was carried out every day ahead of the tractor trains to ensure safe ice and to select the best route. W. G. Stuart, resident engineer for the Department of Mines and Resources, which is building the plant, was in charge of the moving operation, leading the tractor train in a snowmobile.

Urge $250 million fund for North Carolina roads

The board of governors of the Carolina Road Builders Association has adopted a resolution urging the 1949 session of the North Carolina legislature to call a referendum on issuing $250,000,000 in bonds for a 10-year highway construction program.

The board also urged the legislators to submit to the voters a constitutional amendment to prevent diversion of highway-user revenue to any purpose other than for highways.

Iowa towns approve school bond issues

Proposals for school bond issues or special tax levies carried in 11 of 15 Iowa communities which balloted on such questions March 8. The total amount of bonds approved was $7,353,000 while two towns favored special 2½-mill tax levies for school improvements. All of the financing is for new buildings or additions to present ones.

Similar proposals for the issuance of $703,000 in school bonds were defeated in four towns.

British wind tunnels built of concrete

Plywood forms mounted on tubular steel scaffolding simplified construction of two reinforced concrete wind tunnels for the DeHavilland Aircraft Company Ltd. at Hatfield, England. The 200x30-ft. hexagonal all-concrete tunnels make up the legs of an H-shaped testing facility, and are connected by a steel frame workshop at the center.

The tunnels were accurately formed to a ⅛-in. tolerance, and of 5,600 bolt inserts for fastening linings and equipment, only six had to be reset.

Each tunnel is supported along its outer edges by concrete columns on individual footings 6 ft. below grade. After footings and columns were poured, transverse connecting beams were cast integrally with the floor slab on a sand bed 6 in. thick. This material was removed by water jets immediately before forming the upper portion of the tunnel superstructure, to insure loads being transmitted to the footings only.

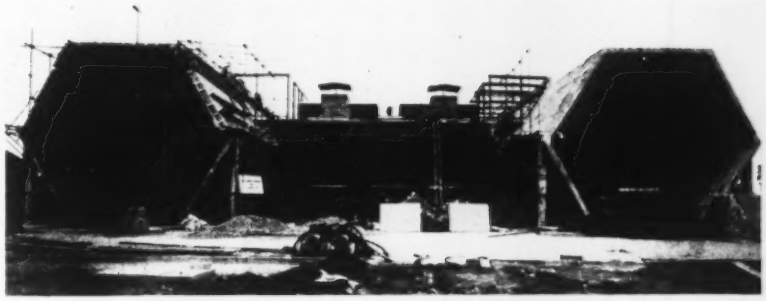
Plywood and steel forms

The superstructure was constructed in two stages, with the first carrying up to just above the mid-height knuckle. Forms for the lower sloping walls were light steel frames with plywood panels attached. For accurate positioning, the exterior frames were supported on temporary steel runners spanning the reinforced concrete floor beams. Interior panels for this section were 5 ft. high, and were fastened to the exterior ones by bolts through precast concrete spacer blocks that also served as anchor holes for inserts placed later.

Inner forms for the upper walls and roof were carried on mobile tubular scaffolding towers that were jacked and blocked in position for a pour. Outside panels were similar to those for the inner wall below.

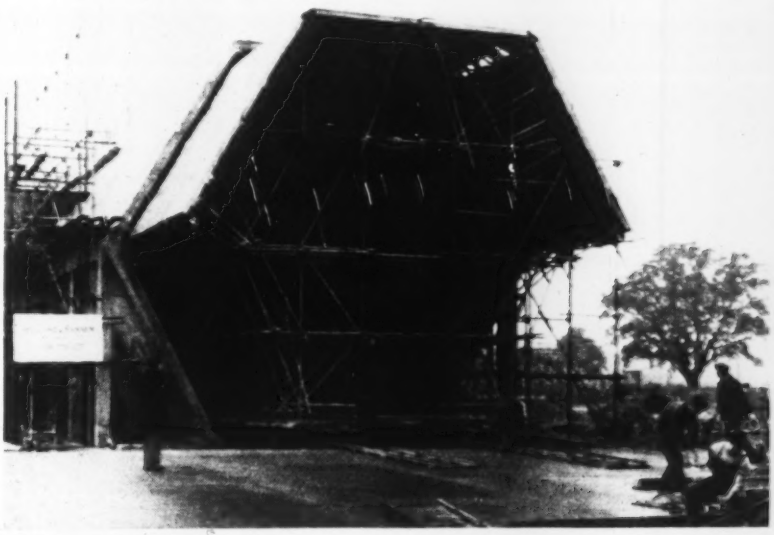
Superstructure concrete was a 1:2:4 mix with an average 28-day strength of 4,200 lb. Concreting started at the center and proceeded outward to obtain fast progress with a minimum of formwork. From a mixer at each end of the tunnel, concrete was taken to the placing area in bucket skips on track trolleys on the tunnel floor and hoisted to place by crane. The walls were poured in 4½-ft. lifts, which were vibrated thoroughly to minimize subsequent surface finishing.

The London firm of Holland & Hannen and Cubitts, Ltd. was general contractor for the project. James Monro & Sons and H. Iorys Hughes, both of London, were architect and concrete consulting engineer, respectively, for the job.



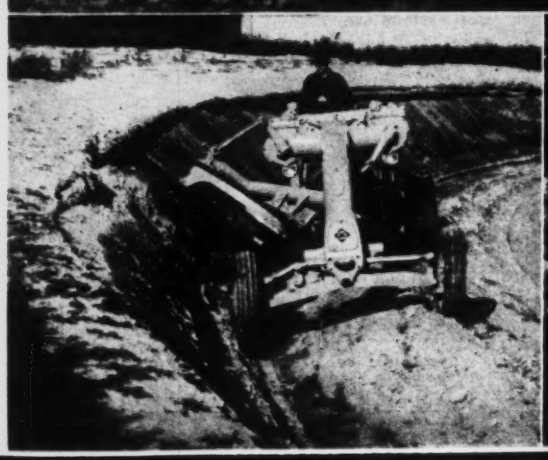
Twin wind tunnels *200-ft. long and 30-ft. wide form sides of H-shaped test structure at DeHavilland Aircraft Company, Ltd., in England. Workshops and equipment are housed in central brick and steel building.*

Form panels *(left) are plywood on light steel walers, held by bolts passing through precast concrete spacer blocks. Concreting (right) starts at center of tunnel; works toward both ends concurrently. Walls are poured in 4½-ft. lifts with concrete from portable mixers.*



Mobile scaffolding *carries plywood forms for upper inside faces of structure. Riding pair of narrow gage tracks, assembly is hauled to position by hand winch operated by men at right.*

MORB



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ENGINEERING SCHOOL NEWS

R. P. I. will try to raise a fund of $27,775,000—New engineering laboratories for North Carolina State—Science Foundation bill is up again

Marks 125th year—Rensselaer Polytechnic Institute, Troy, N. Y., America's oldest engineering institution, which will celebrate its 125th anniversary next year, is undertaking a long-range fund raising effort with a goal of $27,775,000. The first phase of the program will be to obtain at least $1,000,000 from alumni.

President Livingston W. Houston says that the large sum is necessary "if RPI is to meet its responsibilities in the atomic age," and he adds, "The need is not only for buildings to accommodate a future student body much larger than we had anticipated. In this new age of science our need is also for costly new laboratory equipment essential to newly-designed training and research programs. Much existing equipment in laboratories is already obsolete. The need is also for more research and for scholarships and fellowships for talented students requiring financial aid.

Mr. Houston said that an analysis of facilities to achieve these objectives showed need of the following sums: For additional education buildings, $5,750,000; service facilities, $475,000; student recreation, $650,000; living facilities, $4,650,000; and additional endowment funds, $16,250,000. The last amount would be spent for increasing research, scholarships and fellowships, laboratory equipment, faculty salaries, and enlarging the library.

Set laboratory costs—The cost of the new engineering laboratories for the School of Engineering at North Carolina State College will be $965,333 for the building and $245,000 for facilities, according to Dean J. H. Lampe. Architectural plans have been drawn and final specifications are being prepared. The building will have 12 classrooms and two lecture rooms. There are also plans for a mechanical engineering building and an addition to the electrical engineering building. The entire program will cost $2,215,333, all of which has been appropriated.

Science legislation status—The Science Foundation bill has again been placed before Congress. There is now almost universal agreement on the point that brought the President's veto last year—the question of presidential appointment of the director of the Foundation. Senator Smith, Congressman Wolverton, and the scientists are reconciled to having the President name the executive authority of the Foundation. Hence there is nothing substantial blocking passage of a bill this year except one thing: It is not "must" legislation, and as far as politics is concerned, it could be held over until next year. This year's bill would be almost identical with the bill that was vetoed last year except for the placement of the power of appointment of the director.

The North Carolina Water Works Operators' School will be held in Chapel Hill, June 7-11. Sponsored by the N. C. Water Works Operators' Association in cooperation with the N. C. Section of the AWWA, the school will be conducted by the Institute of Government with the School of Public Health of the University of North Carolina.

The new $550,000 engineering building at the University of Akron, Akron, Ohio, for which contracts were recently awarded, will be called Ayer Hall, in honor of Frederic E. Ayer, dean emeritus of the college of engineering, who became the university's first engineering dean in 1914 and continued to teach until June 1947.

Study sanitary practices—Sanitary engineering practice is expected to benefit from a study of trace elements to be initiated under the terms of a half-million dollar gift to the Johns Hopkins University, by John Lee Pratt.

Chairman of the committee, which will undertake what promises to be a 10-year research program, is Abel Wolman, professor of sanitary engineering. Fluorine in water and nutritive constituents in sludge derived from sewage treatment will be among the trace elements to be scrutinized with regard to their effects upon plants, animals and man. Other members of the committee include representatives from the university's staff concerned with biochemistry, geography and preventive medicine.

Seismograph shows weather—Recent tests at Harvard University's seismograph station under L. Don Leet, its director, indicated that increased accuracy in weather forecasting may result from the study of microseisms. The method has been tried only on a small scale so far, but Mr. Leet is of the opinion that certain weather predictions can be made 25 per cent more accurate with the new technique. The slight tremors associated with the advent of hurricanes and other coastal storms can now be picked up over 1,000 miles away, and analyzed by recordings made on the surface without the operator's going underground. Tests with the new seismograph developed at Harvard by Roland K. Blumberg have resulted in considerable success in the study and observation of these minute wave forms.

New Civil Engineering Building—Construction will begin soon on the new University of Tennessee civil engineering building at Knoxville, shown above in the architect's drawing. A part of the university building program voted by the 1947 legislature, the engineering building will be the fifth of 13 new structures planned at Memphis, Martin, and Knoxville. The new building will contain civil engineering classrooms, offices, and laboratories, and will replace Carrick Hall, which burned in December, 1942. It will cost between $700,000 and $800,000. The architects are Barber & McMurray.

OBITUARY

Glenn E. Smith, bridge construction engineer and inspector for the Nebraska highway department, died April 6. He had lived in Lincoln for 62 years.

John Deffenbaugh, 61, Longview, Wash., construction engineer, died in Portland, Ore., April 7.

Joseph C. Wagner, 81, civil engineer, and a former assistant director of the Philadelphia, Pa., Department of Public Works, died April 2. He was a graduate of the University of Penn.

Col. Charles E. P. Babcock, 90, former Buffalo, N. Y., city engineer, died April 10. He joined the engineering division of the department of public works in 1884 after he received his engineering degree from Cornell University. In 1923 he was appointed city engineer, the position he held until retirement in January, 1930.

J. H. Clarkson-Jones, engineer, veteran and a graduate of Trinity College, died at Toronto, Ont., April 12.

John G. Glassco, 68, retired chief engineer and general manager of the Winnipeg, Man., Electrical Commission, died April 12.

Edmund C. Stanton, 70, engineer on the staff of the Office of Supervising Arichitect, Public Building Administration, until his retirement in March, 1942, died recently.

Allan P. Patrick, 99, dominion land surveyor and engineer, died in Calgary, Alta., April 9, only 3 months before his 100th birthday. He started his career as a member of an exploration party in 1869 mapping a route along the shore of Lake Superior for the first transcontinental railway in Canada; in 1877 he made a topographical map of Southern Alberta and in 1888 opened an office in Calgary to establish a private practice which he actively continued until three years ago.

Elwin S. Warner, 65, North Adams, Mass., assistant city engineer, died April 5. He had served in the first world was as a major in the Engineering Corps.

Charles F. Wagner, 69, former chief engineer of J. B. McCrary Co., before he went with the Georgia highway department at Atlanta, died there April 8. He was a graduate of Georgia Tech.

John Robie Parker, 60, former Toronto, Ont., civil engineer died at Halifax, N. S., April 14.

Clifford E. Wheeler, 52, a consulting engineer of Malden, Mass., died April 14 in that city. He was a graduate of Northeastern University.

Maj. Charles Flint, 59, for 20 years construction engineer with the Canadian Pacific R. R., and recently superintendent of construction, Department of Transport, died at Ottawa, Ont., April 13. Major Flint was graduated from the University of Toronto, and was decorated for war service.

Cecil K. Calvert, 61, since 1936 superintendent of purification of the Indianapolis, Ind., Water Company, died April 19. He was a graduate of Earlham College, Richmond, Ind. He became a chemist for the water company in 1908 and was later superintendent of sewage disposal and garbage reduction for the Indianapolis Sanitary District, and was on the Indiana Stream Pollution Control Board.

LeVan Ransom Barnes, 65, superintendent of highways of Wayne County, N. Y., died in Clyde April 14. In 1908 he was assistant engineer in the construction of the Virginian Railroad. In 1911 and 1912 he was assistant engineer on the New York State Barge Canal.

MAJOR MEETINGS

Building Officials Training School, Drake Hotel, Chicago, Ill., April 26-29.

American Wood Preservers' Association, 44th annual meeting, Hotel St. Paul, St. Paul, Minn., April 27-29.

State Sanitary Engineers, Annual conference with Public Health officials, Washington, D. C., April 26-30.

National Public Housing Conference, Inc., Hotel New Yorker, New York, N. Y., May 3-5.

American Water Works Association, 1948 conference, Atlantic City, N. J., May 3-7.

Second Highway Transportation Congress, Mayflower Hotel, Washington, D. C., May 6-7.

Canadian Association of Equipment Distributors, General Brock Hotel, Niagara Falls, Ont., May 10-12.

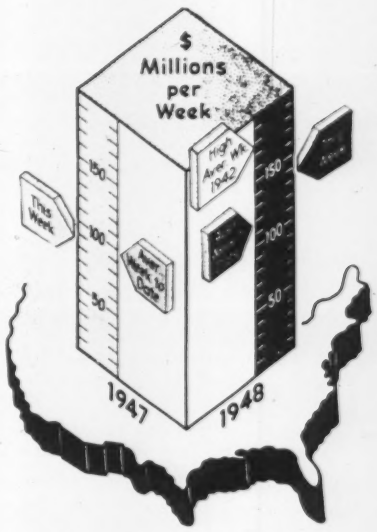
Society for Experimental Stress Analysis, The Roosevelt Hotel, Pittsburgh, Pa., May 27-29.

National Conference of Community Planning, annual meeting, Banff Springs Hotel, Banff, Alta., June 2-5.

American Society for Engineering Education, 56th annual meeting, University of Texas, Austin, Tex., June 14-18.

American Society for Testing Materials, annual meeting, Hotel Book-Cadillac, Detroit, Mich., June 21-25.

CONSTRUCTION ACTIVITY



As Reported this week to . . .
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of Apr. 22 1948	Cumulative 1948 (17 wks.)	Cumulative 1947 (17 wks.)
Federal	$9,336	$356,543	$153,475
State & Mun.	55,751	684,384	480,674
Total Public	$65,087	$1,040,927	$634,149
Total Private	71,656	977,673	1,008,198
U. S. Total	**$136,743**	**$2,018,600**	**$1,642,347**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1948 (17 wks.)	Cumulative 1947 (17 wks.)
Waterworks	$3,742	$53,508	$43,496
Sewerage	8,286	65,216	29,506
Bridges	6,662	20,829	51,169
Highways	21,627	259,281	202,200
Earthwork, Waterways	8,513	165,450	83,409
Buildings, Public	13,629	337,308	153,557
Industrial	13,308	315,083	264,179
Commercial	56,093	582,911	613,156
Unclassified	4,942	148,414	195,675

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1948 (17 wks.)	Cumulative 1947 (17 wks.)
NON-FEDERAL	$1,120,134	$518,164
Corporate Securities	623,132	184,458
State and Municipal	497,002	333,706
Total Capital	**$1,120,134**	**$518,164**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Apr. '48	438.50	210.79
Building Cost	Apr. '48	329.42	178.07
Volume	Mar. '48	250	110

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

Bids Asked April 26

N. Y., New York — Comr. Water Supply, Gas & Electricity, Municipal Bldg., Zone 7, watermains, appurtenances in Wild, Whitman, North Railroad and South Goff Aves., Bay, Cornelia, Graves, Pelton and Sanilac Sts.; Allen, Boehm and Melrose Pls.; Edinboro and Seagate Rds., Shelterview Dr., Crabtree Manor, Seaside and Victory Blvds. and Parkhill Ct., Richmond Boro. Plans deposit $1.

Bids Asked April 28

Ill., Chester—City, Frank Hight, clk., river intake in Mississippi River, incl. 2 m.g. p.d. water treatment plant, auxiliary piping, appurtenances, etc. Approx. $265,000. Extended date. Russell & Axon, 408 Olive St., St. Louis, 2, Mo., engrs. CD 12/30—ENR 1/22.

Bids Asked April 29

Wash., Spokane — City, City Hall, 114,000 ft. c. in. pipe for water sys. imprvs. $175,000. CD 2/13/45—ENR 3/8/45.

Bids Asked April 30

Ill., Elliott — Village, Village Hall, WW pumping station, high service pump, etc. No bids received 4/2. Tracy A. Pitzen, Paxton, engr. CD 3/17—ENR 3/2.

Bids Asked May 3

Minn., Breckenridge—City, Ruth Hamilton, clk., concrete water reservoir. $28,000. Plans deposit $10. Lium & Burdick, Grand Forks, N. D., engrs.

Bids Asked May 3

Minn., Robbinsdale—City, E. A. Janisch, clk., water supply sys. $28,000. Plans deposit $10. Hitchcock & Estabrook, 521 Sexton Bldg., Minneapolis, engrs.

Bids Asked May 4

La., West Lake—Town, WW sys. Fred E. Hess, Fort Worth National Bank Bldg., Fort Worth, Tex., engr. CD 10/8—ENR 10/16.

Tex., Beaumont—City, c/o W. J. Brockman, clk., Lawsons Crossing Pumping Station, incl. installation pumps, piping and fittings. $50,000 Plans deposit $25. Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 7/8—ENR 7/17.

Bids Asked May 6

N. Y., Old Forge—Town, Town Hall, water supply sys. and chlorinator bldg. Field, Emerson & Morgan, Flower Bldg., Watertown, engrs. CD 10/1/45—ENR 10/18/45.

Bids Asked May 11

N. Y., Catskill—Bd. Water Comrs., Village Hall, WW bldg. imprvs. Benjamin L. Smith & Assoc., 11 N. Pearl St., Albany, engrs. CD 8/11—ENR 8/14.

Bids Asked May 14

Mass., Longmeadow — Bd. Water & Sewer Comrs., 20 Williams St., Zone 6, 3,100 lin. ft. 8- to 36-in. surface water drain, appurtenances. Plans deposit $5. P. C. Sinclair, supt.; adv. ENR 4/22.

Bids Asked May 20

Fla., Miami—Water & Sewers Bd. W. A. Glass, dir., 27 N. W. 2 St., mfg., supplying 13 mi. 16- to 48-in. concrete, rein.-con. or steel pipe coated or lined and coated water pipe. Plans deposit $5.

Bids Asked May 27

Wash., Longview—City, City Hall, 3 m.g. reservoir. Over $28,000.

Bids Asked

Tex., Dallas—J. M. Tuttle, Jr., 784 Buckner Blvd., water lines, facilities. $40,000.

LOW BIDDERS

●**Calif., Glendale**—City, P. Serv. Dpt., Apr. 8, 57 m. g. Campbell St. Reservoir, from E. C. Nickel, 120 W. Sierra Madre Blvd., Arcadia, **$1,352,600.** Est. over $1,000,000. CD 3/22—ENR 3/25.

Ga., Atlanta—City, Apr. 12, Hemphill Station Water Purification Plant addn., from Standard Constr. Co., 15 11 St., Columbus, **$517,000.** CD 3/12—ENR 3/18.

Ill., East Galesburg—Village, Village Hall, Apr. 7, imprv. WW sys., from Peerless Service Co., Peoria, **$52,128.** CD 3/31.

Ill., Elliott—Village, Village Hall, Apr. 2, WW distr. sys., from Warner Constr. Co., Hoopeston, **$28,063.** CD 3/17—ENR 3/25.

Ill., Hamilton—City, Apr. 5, exten. WW and imprv. sewers, from Rees Constr. Co., 517½ Kentucky St., Quincy, **$109,003.** CD 3/17—ENR 3/25.

Minn., Neponset—Village, Village Hall, Apr. 6, imprv. WW sys., from W. L. Hall, Atwood, **$37,669.** CD 3/31.

†**N. J., Somerville**—Veterans Admin., 5000 Wissohickon Ave., Phila., Pa., Apr. 5, water storage tank, from W. E. Cadwell Co. Inc., 2240 Brook St., Louisville, Ky. **$54,612.** CD 3/19—ENR 3/25.

N. Y., Poughkeepsie—Bd. P. Wks., rebuilding Slow Sand Filter 1, from Dempsey McCarthy Co., 562 19 St., Brooklyn, **$33,840.** CD 3/26—ENR 4/1.

N. D., Reeder—City, rejected bids Mar. 1, WW sys. Est. **$32,000.** CD 2/12—ENR 2/19.

Pa., Allentown — City, general contract, watermains, required during fiscal year, to United Contg. Co., 117 N. 12 St. Over **$35,000.** CD 3/28/47—ENR 4/17/47.

Tex., Dallas—City, Apr. 2, c.i. water lines, North Ridge Estates, 2 and 3 Sect. Cedar Crest Village, Obenchain, West Commerce, Dirk and McMillan Sts., from E. E. Farrow, 2808 Inwood Rd., **$59,914,** incl. pipe. Est. $37,600.

Tex., Evadale—Champion Paper & Fibre Co., Pasadena, artesian wells, own forces. **$70,000.**

Tex., Fort Worth—City, water imprvs. Sects. 1, 1A, and 2, to Allis-Chalmers Mfg. Co., 1800 N. Market St., Dallas. **$41,285.** Bids 3/21. CD 3/3—ENR 3/11.

Tex., LaPorte—City, project abandoned, WW sys. expans. and imprvs. **$300,000.** CD 3/2—ENR 3/18.

●**Tex., Tyler**—City, W. H. Knight, mayor, Apr. 6, Whiteface Dam, earth fill on E. Prairie Creek, to create 43,000 cu. ft. reservoir as source of supply for city, 400,000 to 500,000 cu. yd. rolled fill, etc., from Carruth Contg. Co., Louisiana Natl. Bank Bldg., Baton Rouge, La. **$1,195,705.** Est. $1,350,000. CD 3/16—ENR 3/18.

CONTRACTS AWARDED

Calif., San Rafael—Marin Municipal Water Dist., 874 4 St., laying steel pipeline, to Pacific Pipeline & Engineers Ltd., 2128 San Pablo St., El Cerrito. **$41,982.** Awarded 4/8.

Ga., Donalsonville—City, WW imprvs., to M. G. Aldridge, Macon. About **$35,000.** J. J. Harte Co., Forsyth Bldg., Atlanta, engr. CD 10/12/45—ENR 11/1/45.

Kan., Augusta—City, exten. WW to Daly & Mitchell, Pittsburg. **$44,760.** Bids 3/29. CD 3/17.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	

Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Mich., Flint—City, watermain distr. sys., to R. H. McManus & Co., 16100 W. 8 Mile Rd., Detroit. **$168,300.** Awarded 4/8. CD 4/10—ENR 5/1.

Minn., Moorhead — City, P. A. Cook, clk., 26,500 lin. ft. 16 in. c.i. pipe, etc., to J. J. Nagel, Perham. **$33,892.** Bids 4/2. CD 3/24.

Minn., Thief River Falls—City, P. G. Pederson, clk., feeder watermain sys., E. 3 St., to Nodland-Eby Co., Starbuck. **$34,853.** Bids 3/17. CD 2/26—ENR 3/4.

Miss., Columbus—City, imprv. WW Contrs. A and B, to Sullivan, Long & Hagerty, Bessemer, Ala. **$575,000.** Bids 3/2. CD 3/9—ENR 3/11, under LB.

Mont., Glendive—City, water presedimentation basin, to Anderson & Millenaifer, Great Falls. **$53,638.** Bids 4/3.

N. D., Minot—City, watermain and sewer extens., to Paul Kemper, 502 5 Ave. S. E. **$449,025.** Bids 3/4. CC

O., Cleveland—City, Div. Water & Heat, City Hall, watermains Chester Ave., to Utilities Constr. Co., 643 Green Rd. **$980,938.** Est. $1,000,000. Bids 3/5, awarded 4/7. CD 4/6—ENR 4/8, under LB.

O., Defiance—City, 9,600 lin. ft. c.i. or asbestos cement watermains, to McManus & McCarthy, Reading, **$43,000.** Est. $45,000. Bids 2/23, awarded 4/6. CD 2/2—ENR 2/5.

S. C., Camden—Town, F. N. McCorkle, mayor, WW imprvs., Sect. 1, settling basins, appurtenant facilities addn., to C. Y. Thomason Co., Greenwood. **$36,600.** Bids 4/7. CD 3/9—ENR 3/11.

Tex., Amarillo—City, c/o C. V. Moss, city mgr., water line extens., incl. 42 in. c.i. suction line and 24 in. concrete drain line, to Bell, Braden, Barker & Gilvin, Inc., Amarillo, **$66,442.** Est. $50,000. Bids 4/6, awarded 4/12. CD 3/25.

Tex., Pettus—Union Producing Co. & Assoc., United Gas Bldg., Houston, drilling and developing water supply wells to serve recycling plant, own forces. **$60,000.** J. V. Witt, c/o owner, consult. engr.

Tex., San Antonio — City, c/o Waterworks Dpt., 1606 W. Market St., addnl. pump. station, incl. 750 ft. artesian well, at Main Pumping Station, to H. J. Von Rosenberg, Builders Exchange Bldg. **$75,000.** CD 3/26—ENR 4/3.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Bids Asked April 29

Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan Ave., West-Southwest Sewage Treatment Works, Div. M, in Stickney. Plans deposit $20. CD 5/17/44—ENR 6/1/44.

Bids Asked May 3

Mo., Boonville—City, Kathryn Cochran, clk., imprv. sewer, incl. 21,921 lin. ft. 8-to 15-in. vitr. clay sewers, 1,993 lin. ft. 8-to 16-in c.i. pipe, 95 manholes, 274 cu. yd. earth and 10 cu. yd. rock excav., 167 cu. yd. concrete, $150,000. S. E. Sombart, Boonville, engr. CD 11/12—ENR 11/27.

Pa., Broomall—Comrs. Marple Twp., Broomall, sewerage sys. $250,000. Damon & Foster, Sharon Hill, consult. engrs.

Bids Asked May 4

N. M., Portales—City, City Hall, 8,500 ft. outfall line, sewage treatment plant. Over $50,000. Plans deposit $25, $15 returnable. Hasle & Green, Wilson Bldg., Lubbock, Tex., engrs. and archts.

Bids Asked May 5

Ga., Atlanta—Fulton Co., c/o County Engr., 501 Courthouse, Terrell Creek Outfall Sewer, incl. 21,974 lin. ft. 8- to 24-in. sewer lines, Proj. S-1. Plans deposit $15. CD 5/23/47—ENR 5/29/47.

Wis., Spring Valley — Village, sewers and treatment plant, 18,119 ft. 8 and 10 in. river crossing, and 36 ft. 8 in. and 50 ft. 4 in. inverted siphon, 71 manholes, 7,000 ft. 6 in. house connections. $130,000. Plans deposit $15. Davy Eng. Co., 502 Main St., La Crosse, engr. CD 3/13/47—ENR 4/3/47.

Bids Asked May 6

Calif., Walnut Creek—Central Contra Costa Sanitary Dist., 1335 Commercial Lane, Central Trunk Sewer, Sect. 5, incl. 5 mi. installation from Lafayette to point northwest of St. Mary's College. Over $50,000. Plans deposit $10. CD 6/16—ENR 6/26.

Tenn., Nashville — State Purchasing Dpt., State Office Bldg., sewage disposal plant at Tenn. Home and School for Feeble Minded. Plans deposit $75. Hart, Freeland & Roberts, 926 3rd National Bank Bldg., engrs.